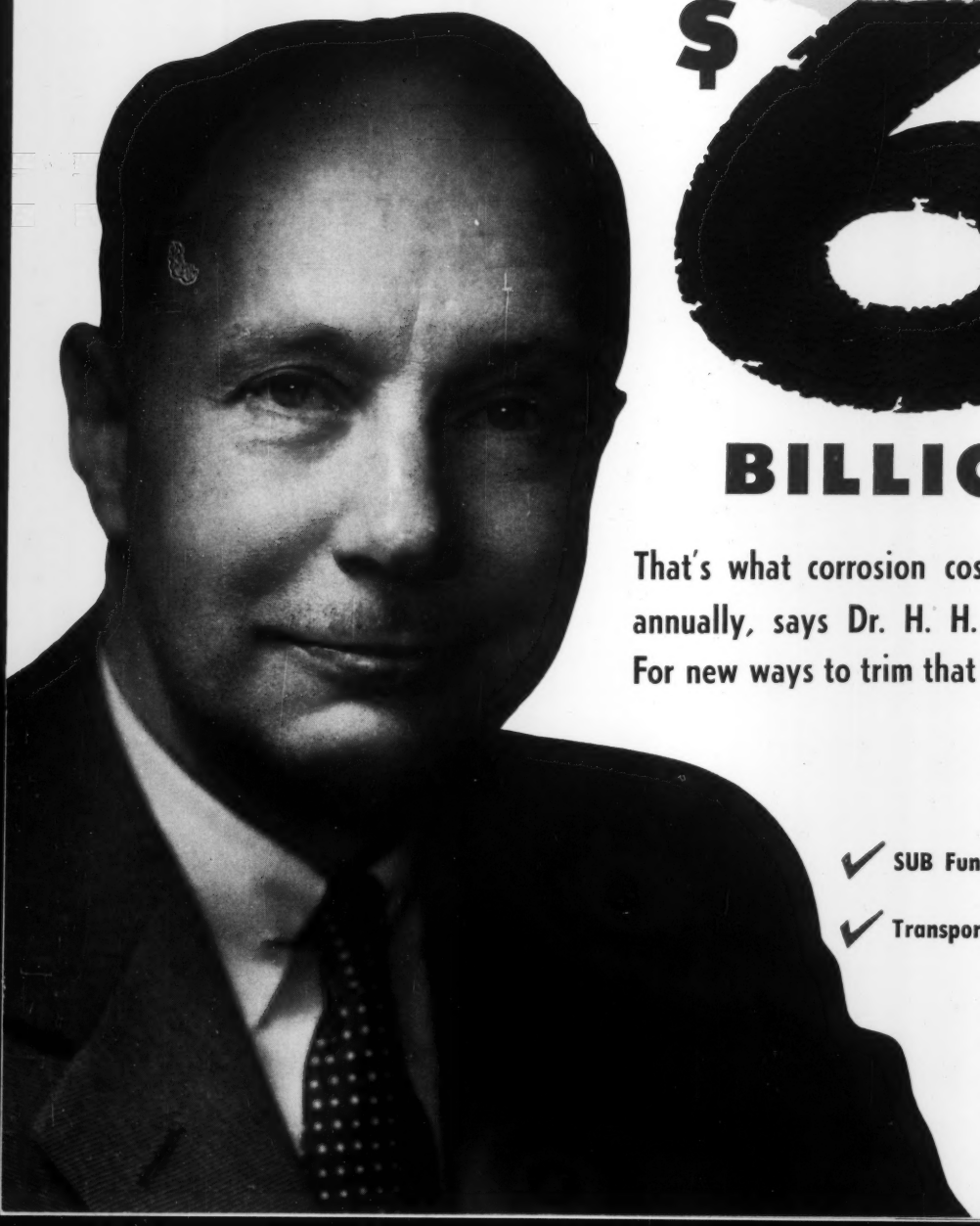
AUGUST 26, 1957

STEEL
The Metalworking Weekly

A PENTON PUBLICATION



$6 BILLION

That's what corrosion costs this country annually, says Dr. H. H. Uhlig of MIT. For new ways to trim that cost, see Page 68

✔ SUB Funds in Good Shape —Page 35

✔ Transportation: 2000 A.D. —Page 46

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No Excessive Heating

New Rectifier Cooling System Prevents Heat Build-up and Damage

when ac Power Fails

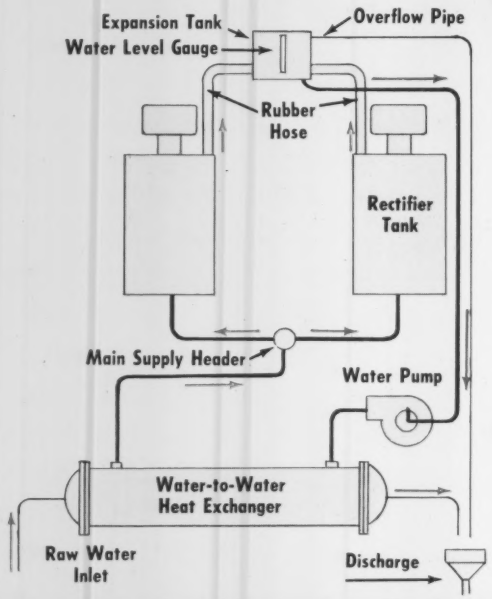
A SAFER, more effective cooling system in the Allis-Chalmers rectifier continues to circulate water *even when an ac power failure stops the water pump.* Heat and steam are dissipated before they can develop to the danger point.

The new system features an expansion tank that extends the full length of the rectifier frame with short vertical connections from each tube. With warm water continuing to flow freely upward, a thermo-siphoning action draws cooler water into the tubes. Build-up of excessive temperatures is prevented. Steam pockets are kept from forming. Subsequent water loss from the recirculating cooling system is minimized.

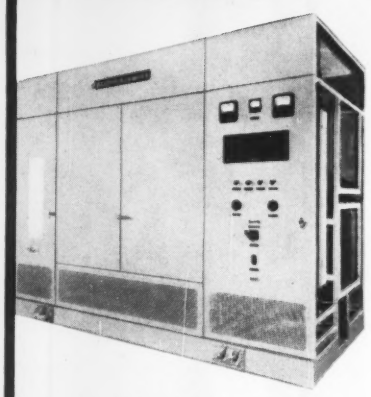
Successful operation in hundreds of installations is your assurance of the complete reliability of Allis-Chalmers mercury arc rectifiers. Contact your nearby A-C office or write Allis-Chalmers, Industrial Equipment Division, Milwaukee 1, Wis.

How the System Works

Water is normally pumped through the water-to-water heat exchanger to the main supply header from where it circulates through rectifier tubes picking up heat. Hot water flows up through the short connections to expansion tank and back down to suction side of water pump.



ALLIS-CHALMERS Mercury Arc Rectifiers

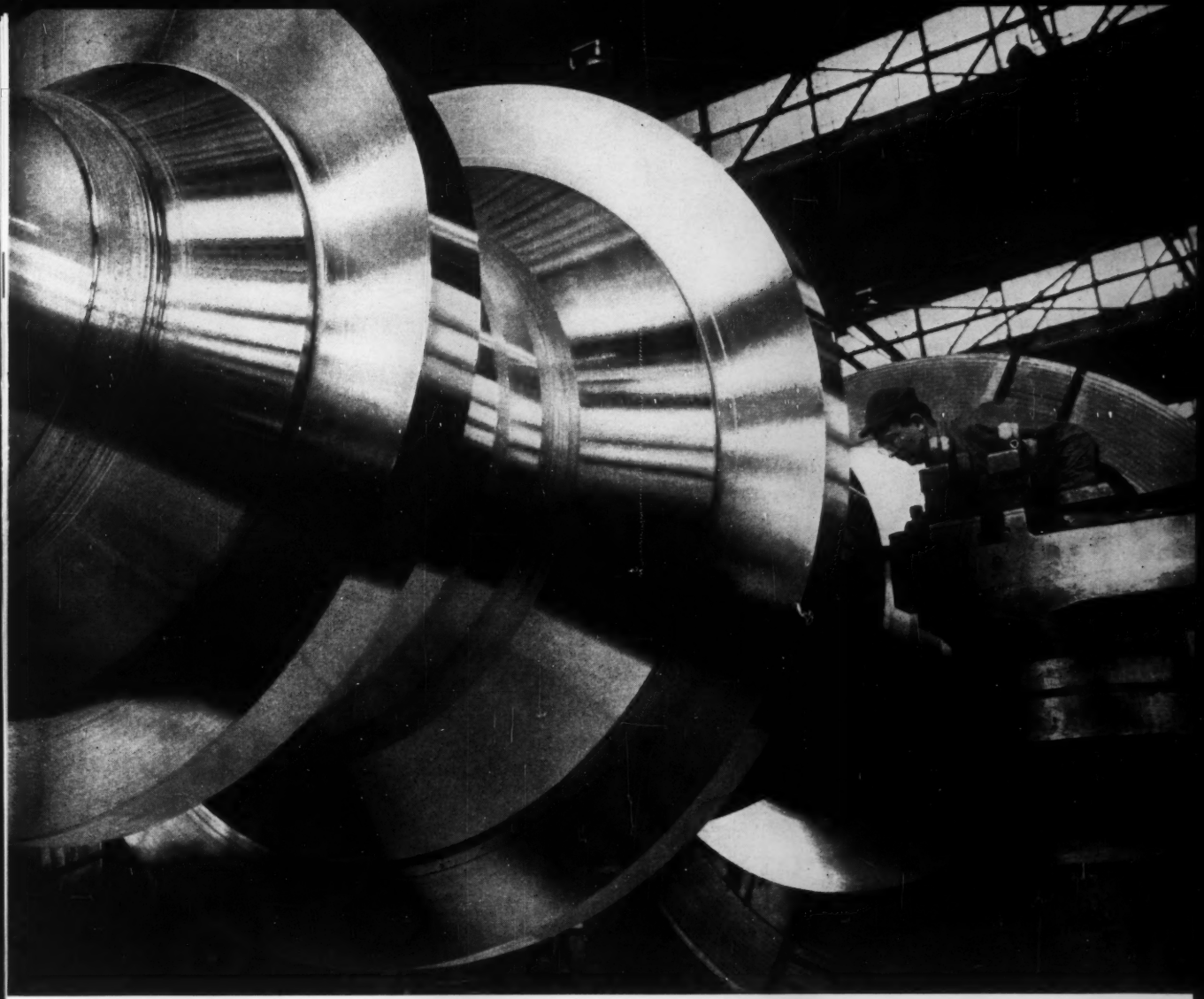


Factory-packaged units cut installation time and costs. Sealed tube rectifiers are supplied in completely enclosed or open types. Here is a typical, completely enclosed, 1000-kw, 250-volt rectifier for steel mill service.

ALLIS-CHALMERS

A-C ALLIS CHALMERS

A-5425



Will help create new stores of power in Pacific Northwest

This huge forged shaft is one of eight produced by Bethlehem for the generating equipment at The Dalles Dam, on the Columbia River. When finally installed, it will have a part in the vast system of power production now under development in the Pacific Northwest.

Of carbon-vanadium steel, the shaft weighs approximately 190,000 lb; is more than 33 ft long, and has a maximum diameter of 96½ in. Its smallest body diameter is slightly over 38 in. Running the entire length of the shaft is a uniform 15½-in. bore.

Forgings of this size are spectacular, and months of painstaking work go into their planning and manufacture. It's a type of assignment that Bethlehem has been handling for many years. But the big "show pieces" are only a fraction of Bethlehem's output. We are equipped to make and machine any kind of forging ever needed—from giant cylinders, shafts, and columns to midgets weighing a pound or less.

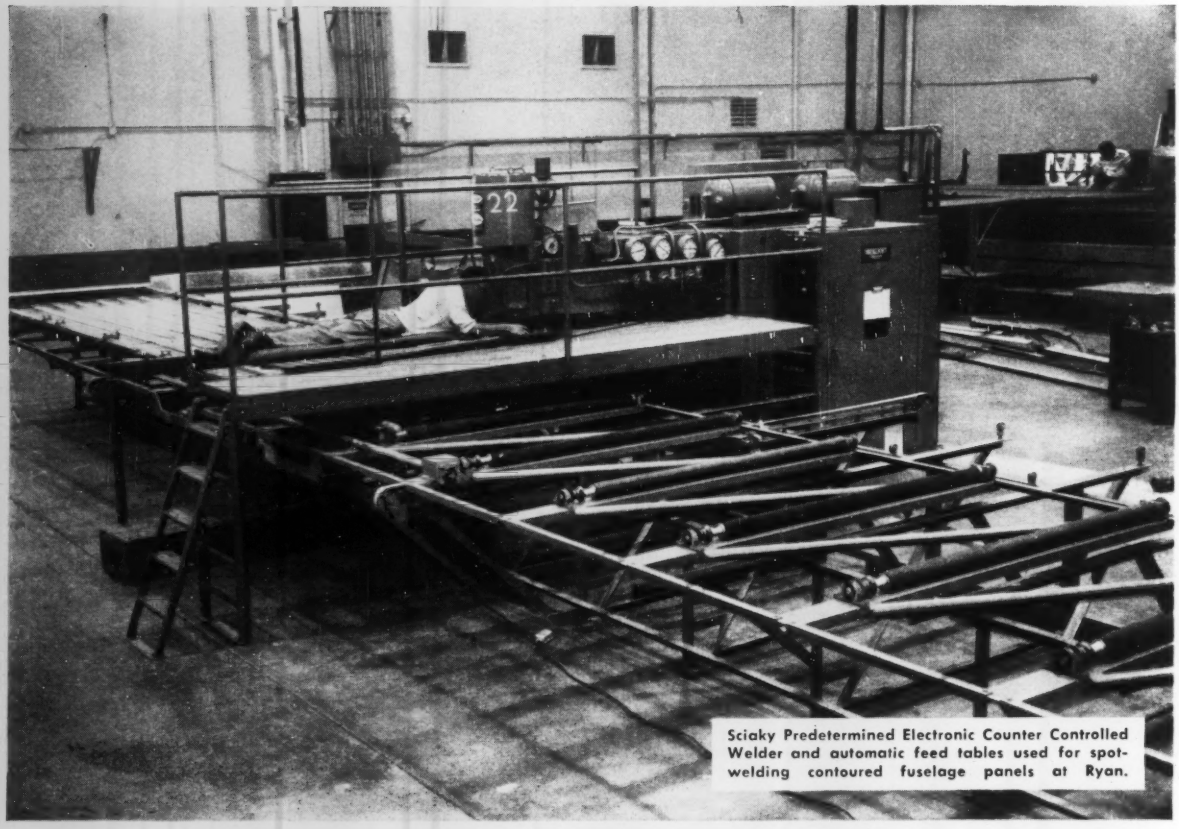
You are invited to check with us when next in the market for press, hammer, drop, or upsetter forgings. Inquiries are welcome, always. Whether your needs are large or small, our engineers will cooperate fully.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

BETHLEHEM STEEL

BETHLEHEM STEEL



Sciaky Predetermined Electronic Counter Controlled Welder and automatic feed tables used for spot-welding contoured fuselage panels at Ryan.

COMPLEX SPOTWELDING PROGRAM AT RYAN IS SEVERE TEST FOR NEW SCIAKY COUNTER CONTROL

Ryan Aeronautical Company, San Diego, California has achieved a significant first in resistance welding—automatic spot welding of large contoured fuselage panels for the Boeing KC-135 and "707" Jets.

Referring to their new Sciaky Counter Controlled Welder, Mr. Bob Fullerton, Ryan's Senior Welding Engineer, stated, *"This is one new welding development that really does what the advance announcements promised."*

PRECISE CONTROL

Early in the program, it became obvious that precise control of all welder functions and absolute production consistency of welding was essential. Introduction of the new Predetermined Electronic Counter Controlled Welder by Sciaky helped solve this problem.

Here, for the first time, is a welder in which functions are controlled to a fraction of a cycle of alternating current. Control settings are realized with exactness. The unvarying accuracy of counting is maintained throughout the entire range for the longest run at the highest production rate. Any production control setting is readily reproducible at any time.

CONSISTENT, SAFE WELDS

The consistently safe welds produced by the Sciaky Counter Weld Control are essential to the Ryan program since the skin is a load-bearing member. In addition, the size of the assembly—largest every sub-contracted in the industry—will not tolerate even the possibility of rejects due to imperfect welds.

The importance of consistently perfect welds is emphasized by the tremendous number of spotwelds in the aft fuselage sections of the Boeing jet tanker-transports. Approximately 77,000 spot welds are required to join skins to skins, skins to doublers and stringers, and bulkhead components together.

TAPE COMMAND OF WELDING OPERATIONS

Welding operations on the various assemblies can be controlled by a tape command unit providing complete piece part positioning in all directions. Automatic interlock between positioner and welder is required. This would provide more automatic operation.

COMPLEX TOOL-UP

Handling and positioning the aluminum skins also presented a major problem. Ryan solved this by installing huge positioning tables with push button controls to permit automatic feeding.

The characteristics and consistent operation of the Sciaky Counter Controlled Welder combine perfectly with the automatic abilities and consistency of the Ryan positioning table to satisfy the requirements of this complex production assembling operation.

LITERATURE AVAILABLE

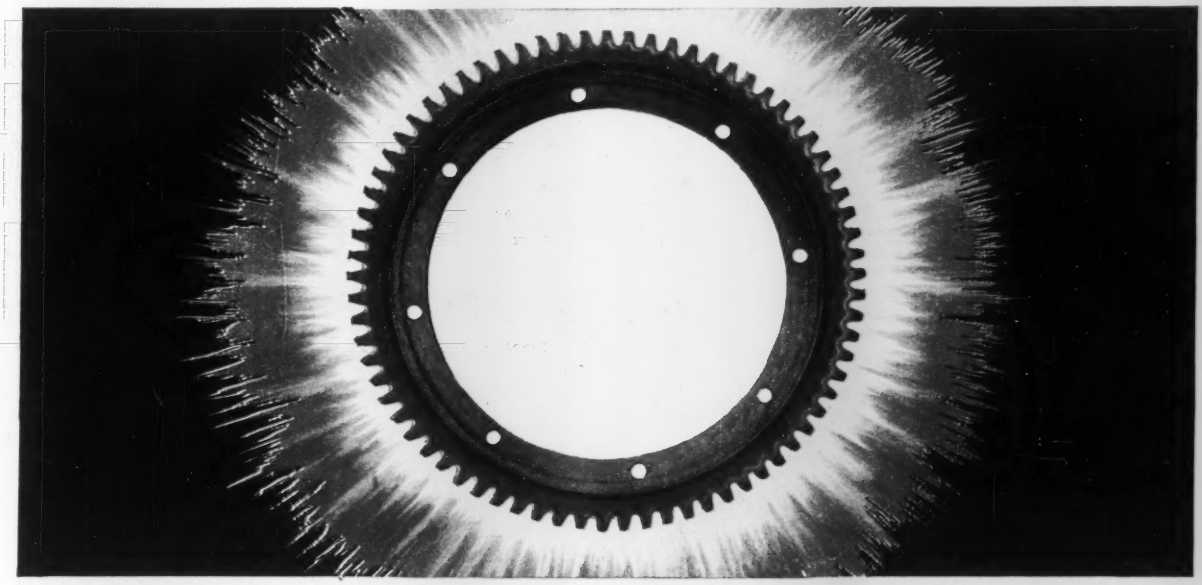
Technical bulletins completely describing the new Sciaky Predetermined Electronic Counter Weld Control are available. Write on your company letterhead requesting Bulletins 338 and 339.

SCIAKY® *Helps Put Profit Into Manufacturing*

Sciaky Bros., Inc., 4909 West 67th St., Chicago 38, Ill., Portsmouth 7-5600

IH Saves $82,507 Per Year

with TOCCO Induction Hardening*



Gears, shafts, pins, wheels, tubes and bars—almost any size or shape of part—or any metal, too—is adaptable to TOCCO hardening, brazing, annealing or heating for forging.

Production Up—Engineers at the Milwaukee Works of International Harvester Company have adopted TOCCO for hardening final drive gears for famous International Harvester farm tractors. TOCCO increases production on the gear shown here from 14 to 35 per hour, 250% faster than conventional heating method, reduces job from a 3 shift to 2 shift operation, even with increased production schedule. Heating time is 35 seconds; oil quench, 60 seconds.

Costs Down—TOCCO cuts cost—saves $82,507 per year on application shown above. TOCCO makes possible use of C-1050 A.R.R. steel instead of expensive A-8645-H alloy steel previously required. TOCCO also eliminates shot-blast, formerly needed to remove scale, and extra machining operations that used to be necessary to compensate for distortion.

Gear shown is 18½" O.D., width of face is 2", weight 34 pounds, 73 teeth. Hardness obtained is 55-66 R.C., using 140 K.W. of 10,000 cycle power.

Our Engineers can probably find applications in your plant where TOCCO can increase output and reduce unit costs.

THE OHIO CRANKSHAFT COMPANY

Mail Coupon Today — **NEW FREE Bulletin**

The Ohio Crankshaft Co. • Dept. S-8, Cleveland 5, Ohio

Please send copy of "Typical Results of TOCCO Induction Hardening and Heat Treating".

Name_____

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Company_____

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For any counting problem...

your Veeder-Root Distributor has a ready "stock answer"

Counting problems and counter applications vary as widely as words in the dictionary. But there's one place where *all* these problems can be met and solved, quickly and at low cost.

That place is the stockroom of your Veeder-Root Distributor. There on his shelves, in the bright red, white and blue packages, are the basic Veeder-Root electrical and mechanical counters that can be adapted to machines and processes in every industry from automotive to zinc die-casting.

Sounds like a "big order." Just try him with an order and see for yourself!
For your nearest distributor, write D. G. Dresser, Veeder-Root Inc., Hartford 2, Connecticut.

Count on
VEEDER-ROOT
to help you build business with Mechanical, Electrical & Hand Counters for every industrial application

Everyone can count on
VEEDER-ROOT
'The Name that Counts'
Hartford 2, Connecticut

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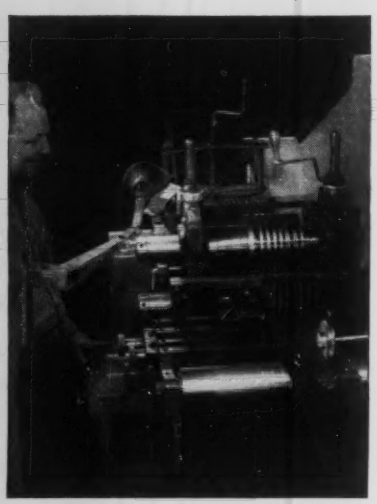


YODER SLITTERS Supply Varied Strip Widths for Tinnerman *Speed Nuts*®

Tinnerman Products, Inc., Cleveland, Ohio, produces more than 10,000 different shapes and sizes of "SPEED NUT" brand fasteners for industry . . . many of them to special specifications.

To do this, Tinnerman uses slit steel strands ranging in width from ⅛" to 7½". To carry an inventory of the many strip widths required to meet normal and unusual demands would be almost impossible.

Tinnerman overcomes these inventory and supply problems by doing their own slitting on two Yoder slitters. This enables them to supply the plant with any strip size required from a relatively small inventory of 6" and 9" width purchased coils. In slitting narrow strands, such as these from small coils, a Yoder slitter may be profitable on a production as low as 25 tons per month.

Here is a fine example of how a small investment in Yoder slitting equipment greatly simplifies and speeds production while effecting important operating economies.

The saving made in time alone, reflects in better customer service through faster completion and delivery of finished products.

If your steel strip or sheet slitting requirements are as low as 100 tons per month or even less, a medium size Yoder slitter can be a very profitable investment for you. The Yoder line includes units of every size and capacity . . . of the most advanced engineering design. Send for the Yoder Slitter Book —a comprehensive text on the mechanics and economics of slitters and slitting line operation, with time studies, cost analyses and other valuable data. Write to:

THE YODER COMPANY
5502 Walworth Avenue • Cleveland 2, Ohio

ENGINEERING YODER MANUFACTURING **ROTARY SLITTING LINES**

behind the scenes

Solution to Dissolution

Matter, as we know, is made up of a lot of stuff with chemical names, but it doesn't seem to reach its natural state until it's all shook up. That is to say, men, ships, flowers, gravestones, and tin dippers are all bound to disintegrate eventually, so everybody is concerned about holding things together as long as possible.

Dr. H. H. Uhlig, whom you met a moment ago on the cover, is greatly concerned about the rush of matter toward dissolution. Dr. Uhlig is a professor at MIT. His subject is corrosion. He worked his slide rule until it was hot to the touch, and arrived at a figure of $6 billion, which he declares is the amount of money industry spends annually to combat and correct corrosion problems.

STEEL's article (Page 68) incorporates some of Dr. Uhlig's suggestions dealing with new methods for preventing corrosion. Some of the forces arrayed against corrosion are inhibitors, specialized protective and metallic coatings, and cathodic protection. Corrosion, of course, is a tremendous problem. It wrecks ships and bridges, guns and cowbells with equal indifference. Because such wrecking can be delayed and held off, insurance companies won't pay for corrosion ruin. Which brings up the story of the captain who put in a claim at Lloyd's because his ship was eaten in two by rust.

"If your ship was destroyed by erosion,"
Said the agent from Lloyd's, "or
corrosion,
You will not collect, sir,
Although she be wrecked, sir;
I suggest that you try an explosion."

To Be Passed Along

When Karl Marx and Friedrich Engles collaborated on a weekly column for the *New York Tribune* scarcely more than 100 years ago, they frequently smuggled hot copy right past their employer, foxy Horace Greeley. Over a period of 10 years, they often fulminated against special privilege, and preached the Revolution with a capital R, but Horace didn't care so long as he sold his papers.

Editors of modern business papers show more concern for their readers. STEEL, for instance, carries editorial and advertising material designed to inform all persons interested in metalworking—and the prospects for smuggling hot copy into this magazine are pretty dim.

Although we submit that the following item has no rightful place in the columns of a business paper, it is so downright purty we are going to risk smuggling it past the editor. If Karl Marx could get away with the divil in the *Tribune,* surely we can attempt a little enchantment in STEEL. This anonymous piece is called "An Irish Blessing."

May the blessing of Light be on you,
Light without and light within.
May the blessed sunlight shine on you
And warm your heart till it glows like
A great peat fire, so that the stranger
May come and warm himself at it, and
Also a friend.

And may the light shine out of the
Two eyes of you, like a candle set in
Two windows of a house, bidding the
Wanderer to come in out of the storm.

And may the blessing of the Rain
Be on you; the soft sweet rain. May it
Fall upon your spirit so that all the
Little flowers may spring up, and shed
Their sweetness on the air.
And may the blessing of the Great Rains
Be on you; may they beat upon your
Spirit, and wash it fair and clean,
And leave there many a shining pool
Where the blue of heaven shines,
And sometimes a star.

And may the blessings of the Earth
Be on you, the great round earth;
May you ever have a kindly greeting
For them you pass as you're going
Along the roads.
May the earth be soft under you
When you rest out upon it, tired
At the end of a day; and may it rest
Easy over you when, at the last, you
Lay out under it; may it rest so
Lightly over you that your soul
May be off from under it quickly, and
Up, and off, and on its way to God.

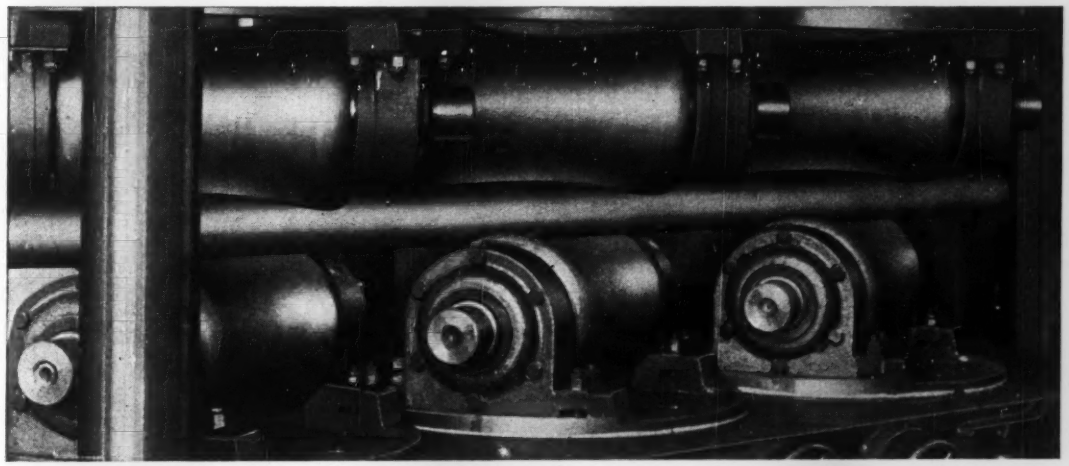
Shrdlu

(Metalworking Outlook—Page 29)

TIPS FROM A ROLL MAKER'S NOTEBOOK

MACKINTOSH-HEMPHILL DIVISION, E. W. BLISS COMPANY, Pittsburgh 3, Pennsylvania

Cast mill rolls • Johnston cinder pots • rotary tube straighteners • end-thrust bearings • heavy-duty lathes • steel and special alloy castings



Line contact of rolls and tubing is shown clearly in this photograph of a tube length passing through the rolls of a Mack-Hemp rotary tube straightener.

Odd twists on roll wear in rotary tube straighteners

The production straightening of pipe and tube by passing it between concave cross rolls is quite unique in the demands it places on the rolls. For example, slippage — the bane of most rolling operations — is a necessity in a rotary tube straightener. Without slippage, the straightened tube will show spiral markings.

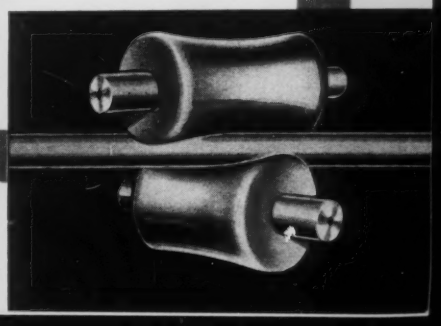
An unattainable goal—Another unusual characteristic of this service is that when properly set, the rolls should wear evenly over their entire work surfaces. This is because the tubing makes a line contact with the roll surface. Thus, under ideal conditions, straightener rolls would operate continuously to worn-out diameter without any redressing at all.

Unfortunately, it is impossible to achieve this ideal. Any given straightener is usually designed to be used with a range of tube diameters. Hence, roll curvature must be for average diameter, a compromise.

First rolls used were "overspecified"—Mack-Hemp engineers have made a very thorough study of straightener rolls—Mack-Hemp itself builds a type of rotary tube straightener. At first, we believed that hard forged steel roll rings on forged steel shafts would be necessary for neck strength and wear resistance, but soon learned that cast steel rings gave longer life. As time went on, we used integral cast steel rolls for economy. Then cast iron rings on forged steel shafts proved best for wear and finally we found solid cast iron rolls to be sufficiently strong and most economical.

Solid grain iron rolls best—Today, we use cast-to-shape low-alloy grain iron rolls in the larger straighteners we build, and recommend their use in most other rotary tube straighteners. (In small straighteners, hardened steel rolls are still practical because of the relatively higher cost of small chilled castings). Mack-Hemp "Technigrain" rolls have ample strength for this service. Casting to shape provides a uniform depth of hardness over the entire surface, while the graphite in the iron has the "lubricant" quality needed for slippage without excessive wear.

The history of tube straightener rolls shows how Mack-Hemp's broad experience in all phases of roll use can help you choose exactly the right roll. Feel free to call on us at any time... there's no obligation.

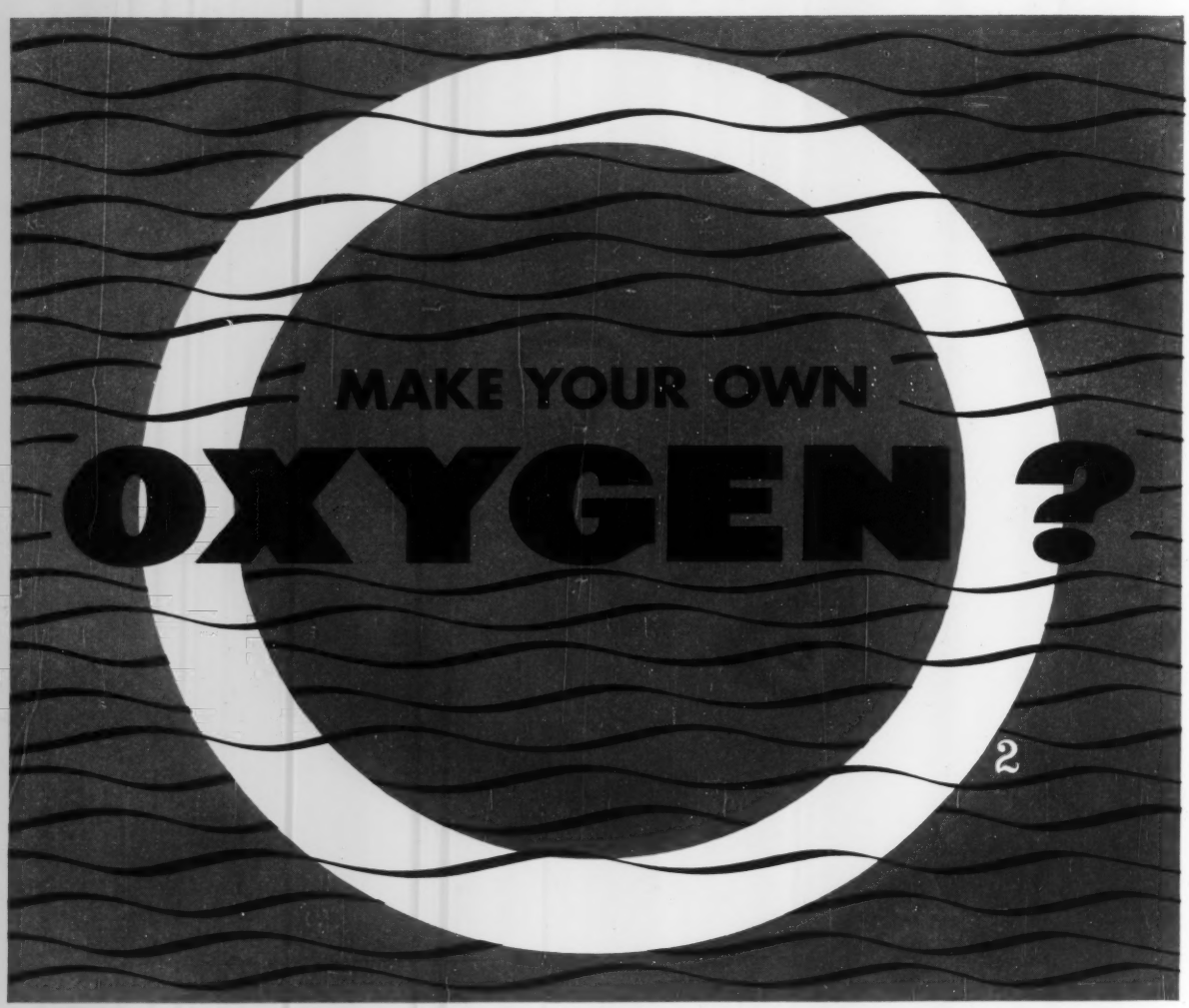


MACKINTOSH-HEMPHILL

You get more tonnage from the rolls with the Striped Red Wabblers

Division of E. W. BLISS COMPANY

Presses, Rolling Mills, Special Machinery



Here's why you'll want to talk with MESSER

Do *your* oxygen needs justify an owned or leased oxygen plant?

Is it more practical for you to buy liquid or bottled oxygen from a reliable oxygen producer?

These questions can only be answered after a careful analysis of your situation is made. And that's why we say you should talk with Messer.

Because:

Messer sells outright or leases oxygen plants to meet every need of the steel and chemical industry.

Messer is also a major supplier of the fast-growing oxygen producing industry.

So talk it over with Messer—no obligation—to make sure you get the best *unbiased* engineering advice.

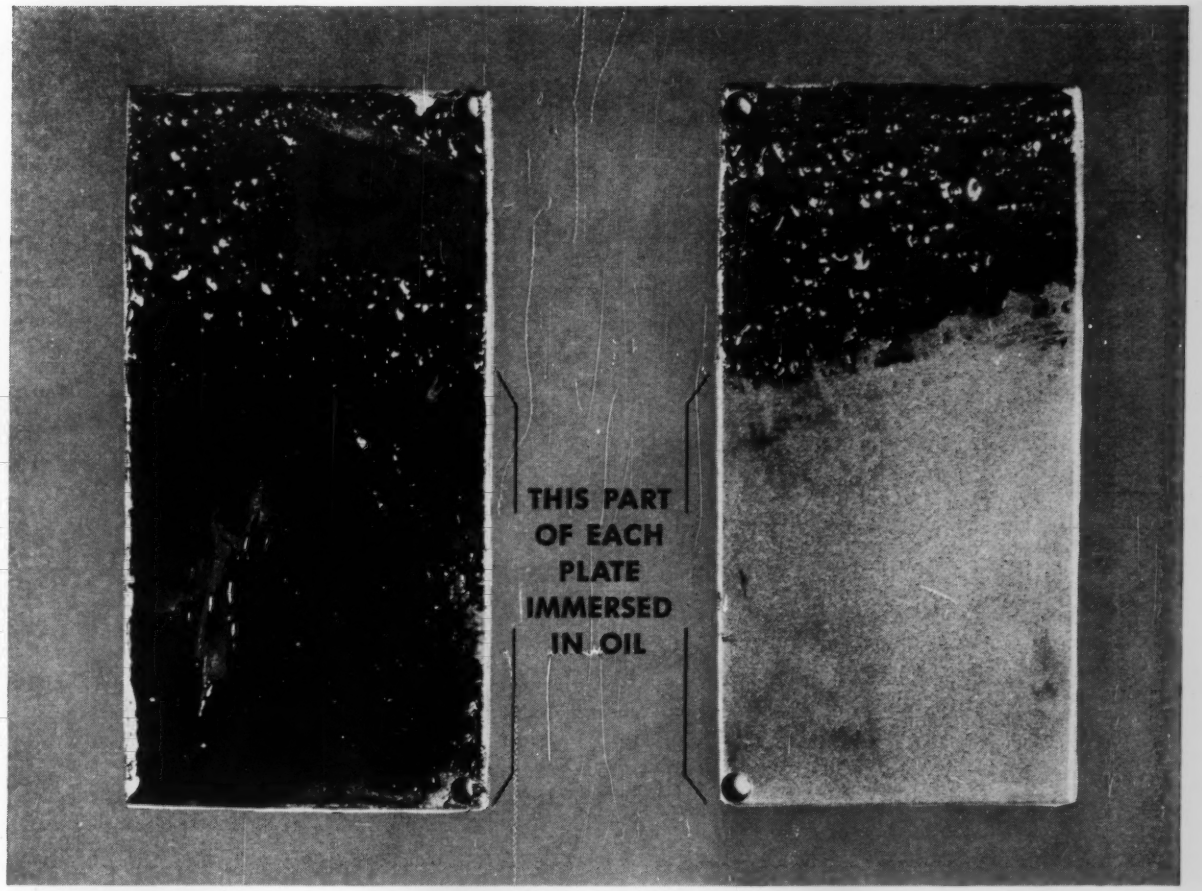
Messer also designs plants to produce nitrogen and argon; in fact, everything for the cryogenic process field.

AMERICAN MESSER CORPORATION

CHRYSLER BUILDING, 405 LEXINGTON AVENUE • NEW YORK, N.Y.

''THERE IS NO SUBSTITUTE FOR MESSER EXPERIENCE''

Messer



This sludge-coated metal plate was partially immersed in a beaker containing a *regular hydraulic oil* heated to normal operating temperature. Though the oil was agitated throughout the test, nearly all the sludge remained on the plate.

This similarly sludge-coated plate was partly immersed in a SUNVIS 700 oil, also heated to normal operating temperature. During the same period, with the same degree of oil agitation, the immersed part of the plate was rinsed clean of sludge.

Simple test shows how

SUNVIS 700 OILS CLEAN HYDRAULIC SYSTEMS...WITHOUT SHUTDOWNS

Sunvis® 700 oils clean while they work. Their cleansing action removes deposits in systems contaminated by dust, sludge, varnish, and other foreign materials.

SUNVIS 700 oils carry these contaminants in suspension for easy removal. This eliminates costly teardowns. Systems stay clean. In addition to being ideal for hydraulic systems, SUNVIS 700 oils are also suited for circulating systems and gear boxes.

If you want exceptional cleaning ability, oxidation stability, rust prevention, film strength, you need SUNVIS 700 oils. Ask your Sun representative for full details, or write to SUN OIL COMPANY, Philadelphia 3, Pa., Dept. S-8.

INDUSTRIAL PRODUCTS DEPARTMENT

SUN OIL COMPANY Philadelphia 3, Pa.

IN CANADA: SUN OIL COMPANY LIMITED, TORONTO AND MONTREAL

SUNOCO

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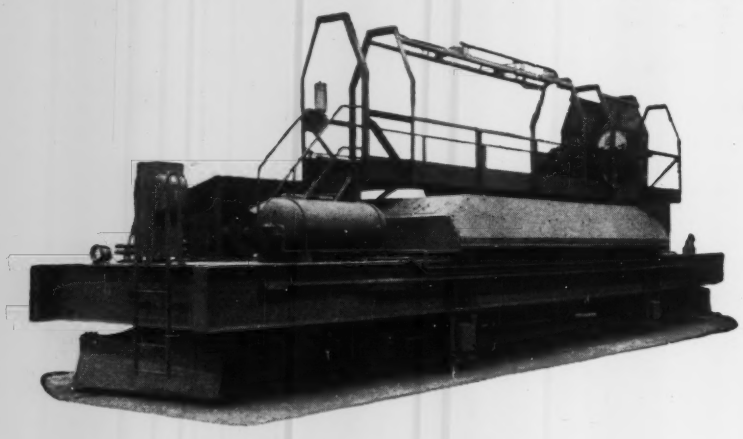
STOCK HOUSE OR HIGH LINE

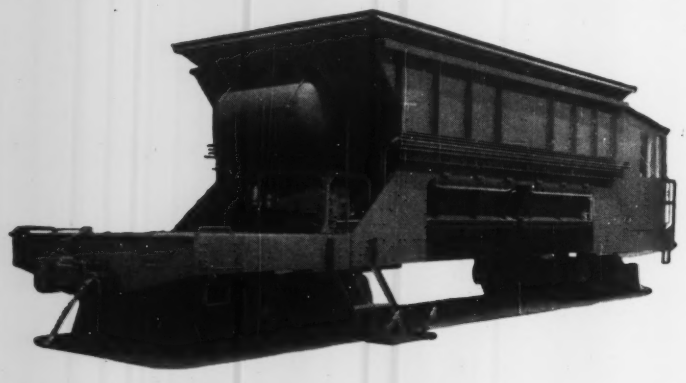
operators prefer the

DEPENDABILITY OF ATLAS CARS

These specially designed units are another example of the ruggedness of Atlas Cars. Their dependability helps maintain the most rigid furnace charging cycles.



40-TON SCALE CAR
Double Hopper Bottom Dump



75-TON ORE TRANSFER
Gable Bottom Double Side Dump

THE ATLAS CAR & MFG. CO.

ENGINEERS MANUFACTURERS
1140 IVANHOE RD. CLEVELAND 10, OHIO, U. S. A.

LETTERS
TO THE EDITORS

Lauds STEEL Writing Style

I would appreciate two copies of the article, "Trend Up in Arbitration" (July 22, Page 60).

As usual, you provide in a small package important and valuable management information, with clear, concise instructions for putting this information to practical use.

It seems to me that some of the emphasis that is placed upon our need for greater reading speeds might be used to better advantage in emphasizing the need for clear, concise factual writing.

Because the articles in STEEL provide this kind of writing, it has become one of the few select publications I look forward to receiving.

A. C. Lachstadter
Huffman Mfg. Co.
Celina, Ohio

Editorial Should Be Posted

Just a note to express thanks for your masterful editorial reprints.

Your July 22 editorial, "The Right To Manage" (Page 55), should be read by labor, as well as by management, and posted on all college bulletin boards.

No reply is expected. Please use the time to write more of the same.

E. A. Sprague
Vice President
Whitehead & Sprague Inc.
St. Louis

Likes Production Ideas Series

May we please have a few reprints of the 13th article in your Production Ideas series, "Look to Aluminum Die-castings" (Aug. 5, Page 89)? It is another in a fine series of production processes. Keep up the good work.

Ernest W. Brix
Die Casting Div.
Hampden Brass & Aluminum Co.
Springfield, Mass.

Clarification of Points

The article, "Reducing Seniority Costs" (July 8, Page 58), makes some suggestions which, for me, need clarification. Mostly, they reflect the need for contract language.

For instance, you suggest bumping only the lowest seniority employee in a group or classification. Is this in a metal trades type of classification, or what? And do you have language to fit this situation?

Is there positive language to use to avoid provisions which allow a senior employee the prerogative of selecting

(Please turn to Page 12)

AT MASSACHUSETTS STEEL TREATING CORPORATION . . .

NEW General Electric Induction Heater Brazes and Hardens up to 3 Tons of Job-lot Parts Every Day

The new General Electric induction heating equipment used at Massachusetts Steel Treating Corporation, Worchester, Massachusetts, quickly won the praise of Mr. Harry E. Boorky, their manager of manufacturing.

FAST, HIGH QUALITY: Says Mr. Boorky, "The unit gives us automatically controlled heating and quenching cycles for treatment of the entire length or of any portion of the piece in only one pass."

BETTER CUSTOMER SERVICE: "In addition, this new G-E heater gives us the advantage of quick-set-up changes required of the high-quality job-lot production we do for our customers.

"Because induction heating can be carefully controlled to the exact point where needed and because it is extremely fast, the parts which we treat are virtually free of troublesome scale—so customers are relieved of many cleaning operations. They also save on press or hammer maintenance and die life is increased."

FOR YOUR APPLICATION: General Electric electronic induction heaters are available in four ratings—7½-, 15-, 25-, and 40-kw, with a choice of four different models in each rating. These four models provide various control combinations, so you can buy the one induction heater which best matches your production pattern from the standpoint of both rating and control. You don't buy wasted capacity.

HEAT TREATING PROBLEMS? Just call your local General Electric Apparatus Sales office, or send the coupon at right.

GET MORE INFORMATION

GENERAL ELECTRIC COMPANY
SECTION A722-7
SCHENECTADY 5, NEW YORK

Please send me a copy of Bulletin GEA-6333.

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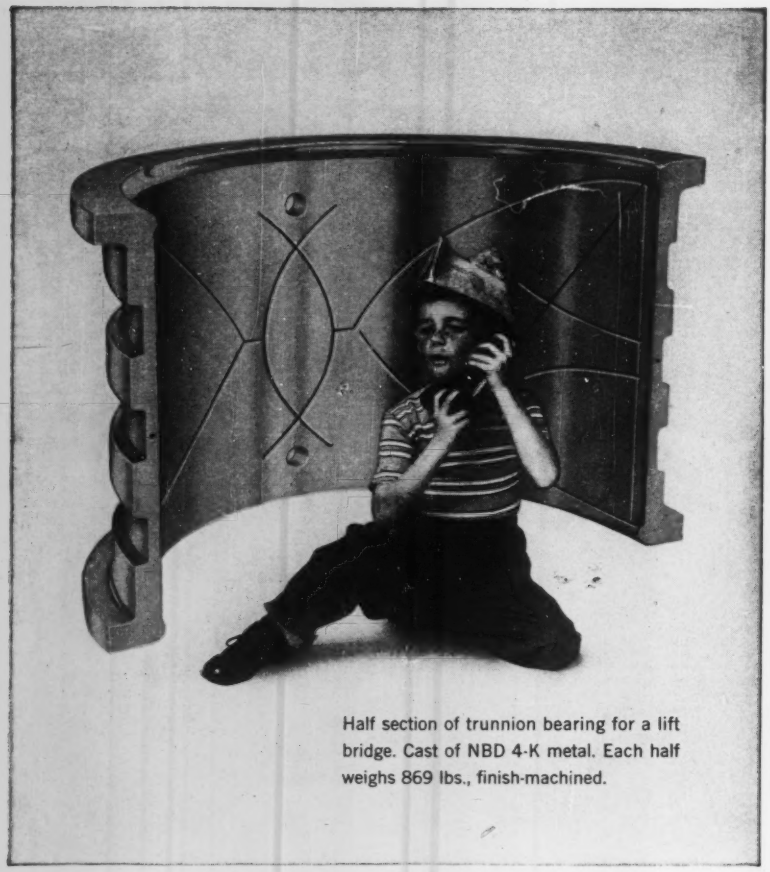
GENERAL ELECTRIC



Half section of trunnion bearing for a lift bridge. Cast of NBD 4-K metal. Each half weighs 869 lbs., finish-machined.

CALL IN **NBD**
FOR BIG **BRONZE**

Need "big bronze" like this, with oil holes and grooves cast right in? We cast and machine them to tolerances precisely held to your specifications. That's one advantage you gain through NBD's unsurpassed knowledge of casting techniques and machining facilities.

On smaller sizes or production runs, too, you can depend on top quality from NBD. Our specialty is bronze metallurgy . . . we've developed more than 40 special alloys. And we're completely equipped for shell-mold, cast-to-size, centrifugal casting . . . as well as sand casting.

For bearings, bushings, gear blanks, pump parts, call or write us for quotes or information.

AMERICAN Brake Shoe COMPANY

NATIONAL BEARING DIVISION
4930 Manchester Avenue • St. Louis 10, Missouri
PLANTS IN: CHICAGO • ST. LOUIS • MEADVILLE, PA.

LETTERS

(Concluded from Page 10)

his assignment within a group? Or, do you just have to avoid the practice of choosing from building up?

Next, how do you define what you mean by ability—and get it in a labor agreement?

Can you tell me names of prepared tests for capacity to a job, or the names of companies which have successfully developed such tests?

Thanks. You can blame all this on Shrdlu (see Page 6).

Seymour J. Burrows
Director of Industrial Relations
Maremont Automotive Products Inc.
Chicago

• *We will be happy to forward our clarification of these points as well as suggested contract language covering them to interested readers. Address: STEEL, Editorial Service, Penton Bldg., Cleveland 13, Ohio.*

President Approves Policy

Your editorial, "Parable of the Prices" (July 15, Page 51), so fully states, in an interesting and amusing fashion, the pricing policies I have followed that I would like 30 copies to hand to our salesmen and other key employees who have expressed doubts as to the soundness of our policy.

I never pass up your Outlook pages. They give me a tremendous amount of news in a few minutes of interesting reading; and your editorials invariably stir up some new thought or apply a new "slant" to old and proved philosophies to thus revitalize my interest in the subject. They are sincerely appreciated.

Harry J. Blum
President
Armstrong-Blum Mfg. Co.
Chicago

Your editorial appeals to me strongly. In my opinion, it will become a classic "in the business." We would like 100 copies.

Budd A. Reesman
E. R. Hollingsworth & Associates
1004 Talcott Bldg.
Rockford, Ill.

New Training Course

Thank you for sending so promptly the first two articles in your 1957 Program for Management series. We are in the process of preparing a training course for supervisors and hope to expand it into a management development program. The information in your articles will be valuable in helping us orient our program.

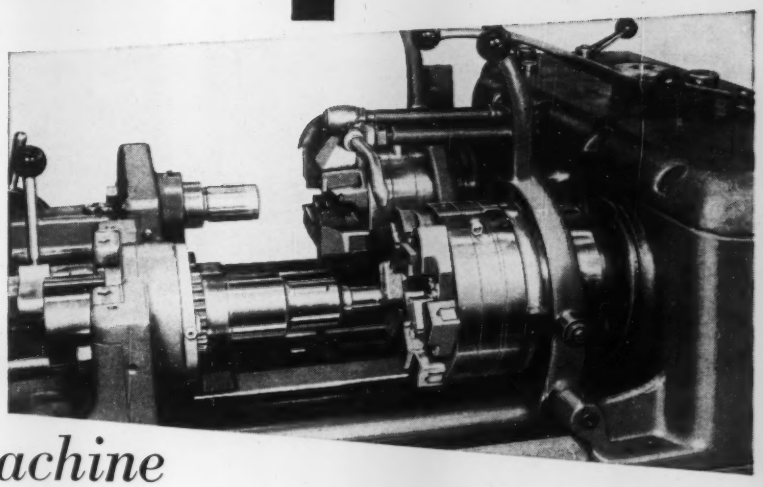
Con W. Carver
Personnel Dept.
Computer Systems Div.
Ramo-Wooldridge Corp.
Los Angeles

Usership of Equations

May I have an extra copy of your excellent two-part article, "Maintenance of Equilibrium in Blast Furnace Operation" (Part I, July 29, Page 120, and Part II, Aug. 5, Page 96)? I should like to have our blast furnace superintendent check the author's equations and calculations after substituting our normal burden.

A. M. Tredwell Jr.
Vice President
Sharon Steel Corp.
Sharon, Pa.

¾"-4.320" THREADING RANGE



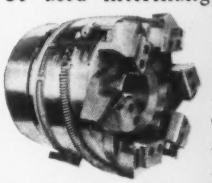
with one LANDMACO machine

The Twin Disc Clutch Company Hydraulic Division in Rockford, Illinois, is able to thread a wide variety of work from ¾"-32 pitch to 4.320"-12 pitch with just one LANDMACO Threading Machine.

A six-chaser 40RX LANCO Head with a range of 2½" to 9¼" (5⅛" bore) is mounted on the right-hand spindle to produce fine-pitch large-diameter threads. A 2½" R LANCO Head with a range of ½" to 2½" is used on the other spindle to produce coarse-pitch threads, small-diameter threads, and long thread lengths.

One of the many different operations performed by this equipment is illustrated—threading clutch output shafts with the 40 RX Head. The workpiece is made from C1045 steel, heat-treated to 229-269 Brinnell hardness. A special 12-pitch UN Thread, with a 3.669"-3.676" pitch-diameter tolerance, is cut .830" long to within ¼" of the shoulder. 15 pieces are threaded per hour, including 100% inspection by gauging on the machine. Even with heat-treated material and exacting thread finish requirements, 100 pieces are completed between chaser grinds.

Special workholding fixtures (which may be used interchangeably with standard vises) are a major factor in the versatility of this equipment at Twin Disc. In the operation illustrated a special carriage front allows threading a workpiece with a diameter well beyond the normal range of the machine.

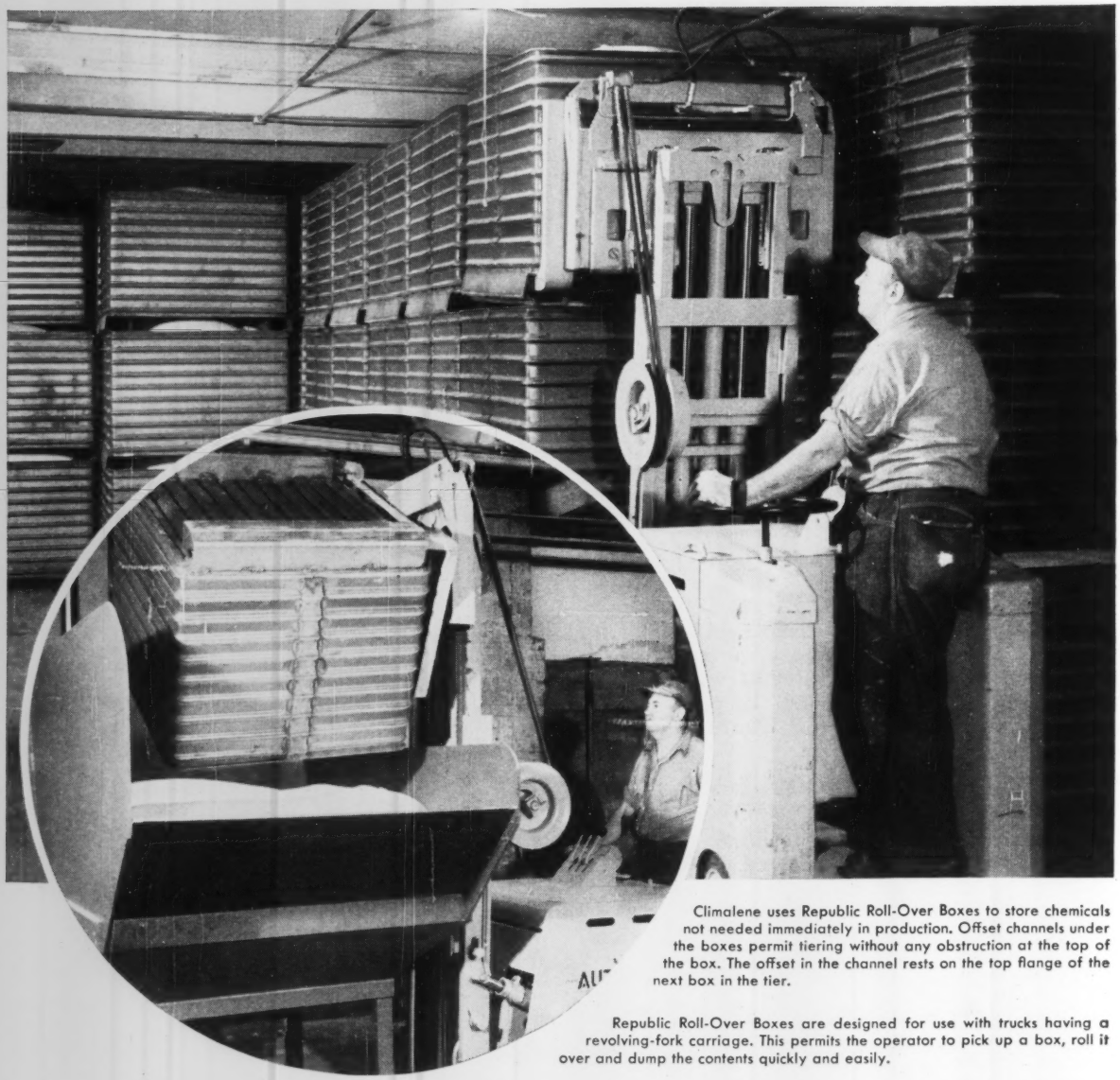


Ask for Bulletin F-80 or F-90 (Die Heads)—H-76 (LANDMACO Machines).

LANDIS *Machine* COMPANY | **WAYNESBORO PENNSYLVANIA • U. S. A.**

456

HOW TO SPEED HANDLING, CUT COSTS, SAVE MAN-HOURS,



Climalene uses Republic Roll-Over Boxes to store chemicals not needed immediately in production. Offset channels under the boxes permit tiering without any obstruction at the top of the box. The offset in the channel rests on the top flange of the next box in the tier.

Republic Roll-Over Boxes are designed for use with trucks having a revolving-fork carriage. This permits the operator to pick up a box, roll it over and dump the contents quickly and easily.

REPUBLIC

REPUBLIC STEEL

World's Widest Range of Standard Steels

REDUCE LOSS, SAVE SPACE

CLIMALENE COMPANY DOES IT WITH THE HELP OF REPUBLIC ROLL-OVER BOXES

The Climalene Company's Chicago packaging operation is proof of the savings that can be attained when materials handling equipment is engineered for the job.

Originally, chemicals used in the manufacture of Climalene were received in 100-pound bags in box-car quantity. Unloading one car and delivery of the bags to the mixing room required the services of five men and consumed six man-hours of time. This did not include the subsequent time required to open the bags and dump the contents into the mixing bins.

Then, because of a production increase, Climalene switched over to bulk shipment, receiving the chemicals in 60-ton hopper cars—giving a substantial saving in bags and bag disposal. This presented an entirely new handling problem. Republic Materials Handling Engineers were contacted and helped work out a sift-proof, bulk-handling system that is both fast and economical.

This new system, built around the use of Republic Roll-Over Boxes, provides these cost-saving advantages:

(1) One man using Roll-Over Boxes can now unload a complete car in considerably less than half the man-hours required under the old system, providing a substantial yearly savings.

(2) When used in combination with fork trucks having revolving carriages the boxes can be rolled over and the contents dumped, thus saving several handling steps.

(3) Design and construction features of Republic Roll-Over Boxes permit tiering to any practical height, thereby saving floor space.

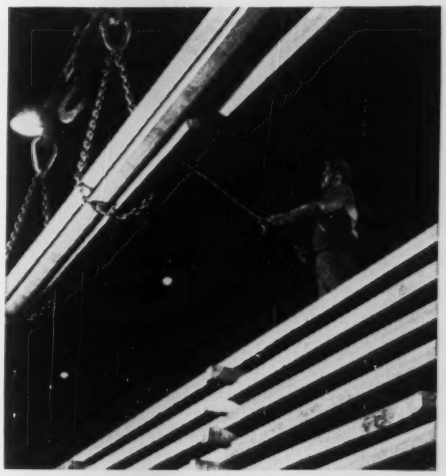
(4) Chemical loss caused by bag breakage is eliminated.

(5) The bag-disposal problem is eliminated.

What about your plant? Perhaps a specially engineered or standard unit could cut your costs or simplify an operation. Why not talk over your problem with a Republic Engineer? There's no obligation. Contact the nearest Republic Materials Handling Representative. Or send us the coupon.

STEEL

and Steel Products



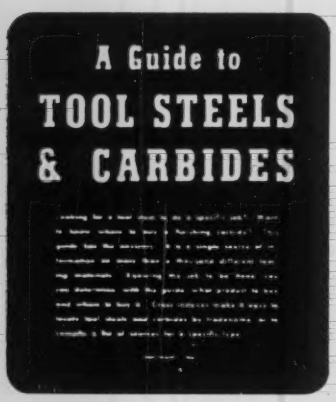
SPEED HANDLING of heavy materials, like bar stock, with Republic Chain Slings, Attachments and Accessories. All Republic Chain Slings are proof tested and warranted to meet or exceed specifications. They provide an exceptionally high degree of safety. Republic's Bolt and Chain Division makes chain slings in Alloy Steel, High Test Steel and Wrought Iron. Republic Chain Engineers are always available to help you select the proper chain for your particular requirements.

SAVE SPACE and simplify palletizing and stacking of bulky, uneven, odd-lot and fragile materials with Republic Steel Pallet Racks. Tubular steel supports adjust every six inches to handle palletized material of any height. Two-way entry permits loading and unloading from either side. Select single pallets from any level without restacking. Write for complete description, specifications and quotations.

REPUBLIC STEEL CORPORATION
Dept. C-3349 R
3120 East 45th Street
Cleveland 27, Ohio

☐ I am interested in more information on Materials Handling Equipment.
☐ Have a Materials Handling Engineer call.
Send additional information on: ☐ Chain Slings ☐ Pallet Racks

Name_____ Title_____
Company_____
Address_____
City_____ Zone____ State_____



HERE'S HELP for your tooling problems

Looking for a tool steel to do a specific job? Want to know where to buy a finishing carbide? This guide has the answers. It is a single source of information on more than a thousand different tooling materials. Knowing the job to be done, you can determine, with the guide, what product to buy and where to buy it. Cross indexes make it easy to locate tool steels and carbides by tradename, or to compile a list of sources for a single type.

40 PAGES

Copies of the Guide to Tool Steels & Carbides are available from Editorial Service, STEEL, Penton Bldg., Cleveland 13, O., at the following prices:

1 to 10	$2.00 ea.
11 to 50	1.90 ea.
51 to 100	1.80 ea.
101 to 200	1.70 ea.
over 200	1.60 ea.

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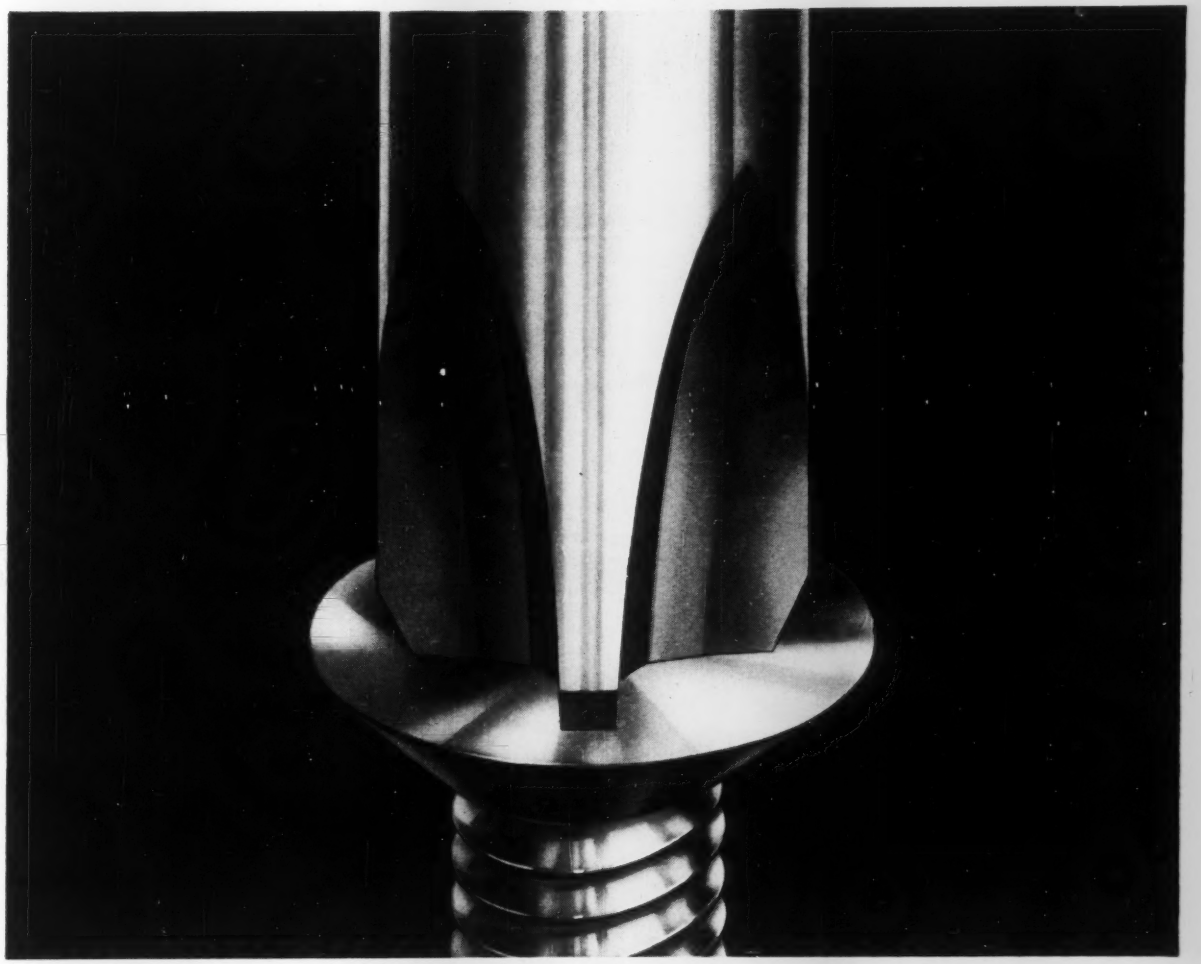


Large enough to meet <u>any</u> production schedule . . .

Interested enough to care about <u>every</u> customer!

AMERICAN is the name!

American *is* the name for fastener service because we're staffed and equipped to meet the demands of any high-volume production schedule . . . and flexible enough to be interested in *every* customer.

This kind of "we-care-about-you" service is one of the four factors that make American the biggest bargain in fasteners . . . in price, service, quality and research.

American Gives You More of All Four

In Quality, with such control techniques as statistical sampling of production runs to maintain product uniformity.

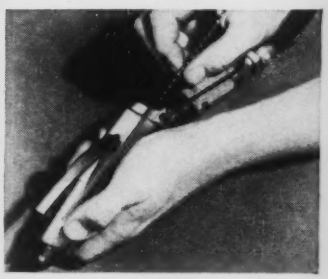
In Research, that developed the original Phillips fastener.

In Service, for clockwork delivery on anything from single-case to carload lots.

Prices may sometimes vary under local circumstances, but nowhere will you get more of all four than from American.

Make Your Own Comparison: send us your inquiry for price and delivery or your specifications for special fasteners. Write:

American!



SCREWSTICK, another American development, being loaded into air-powered driver.

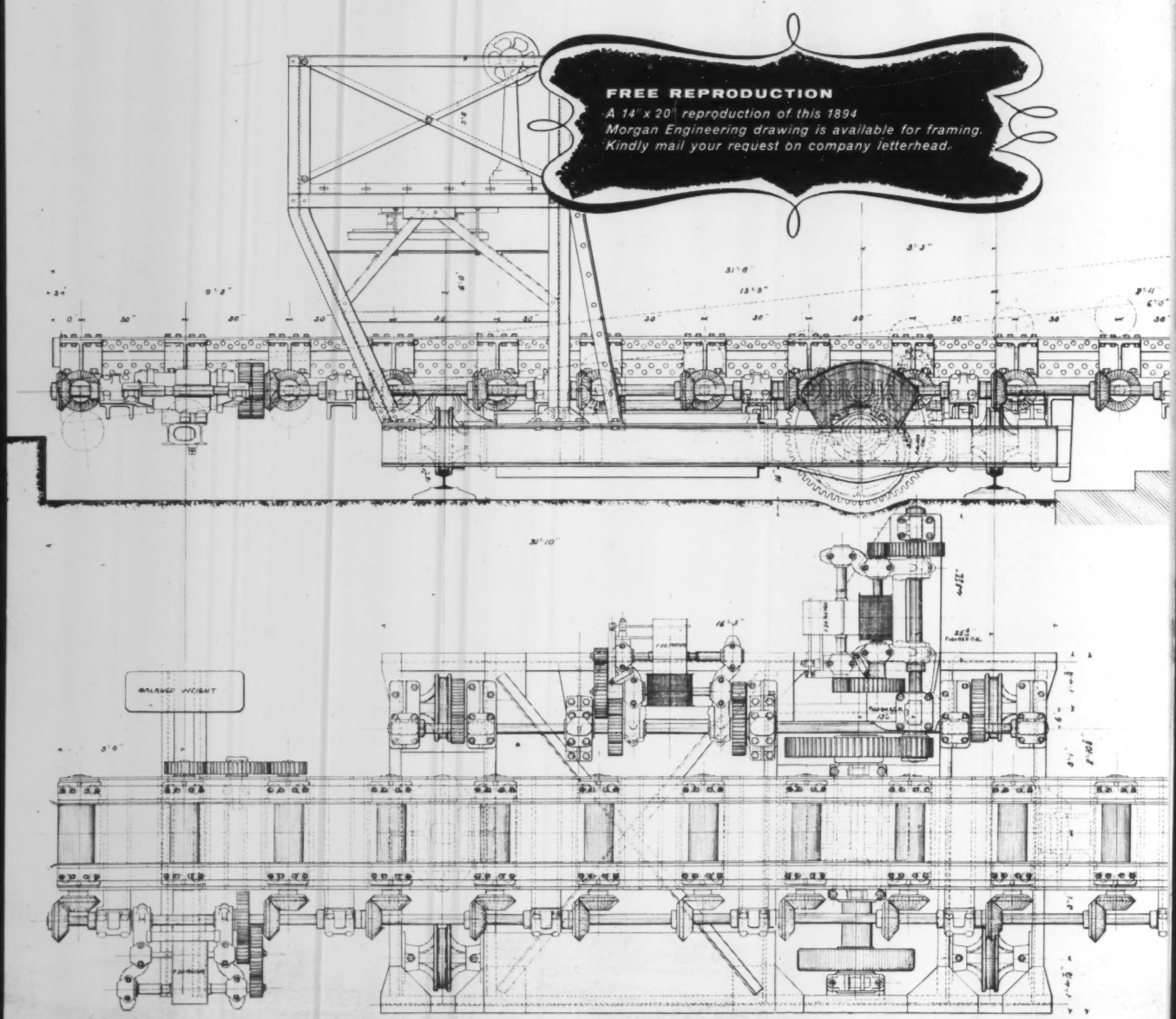
AMERICAN SCREW COMPANY
Willimantic, Conn.
Chicago, Ill. • Detroit, Mich.

WE grow our own SKILLED

...TO ASSURE THE QUALITY OF

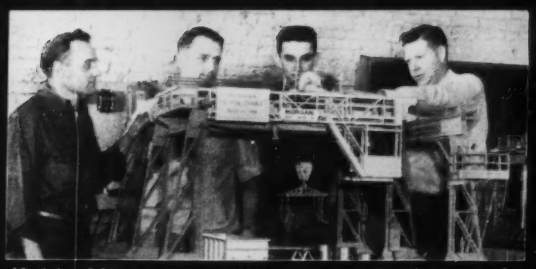
FREE REPRODUCTION

A 14" x 20" reproduction of this 1894 Morgan Engineering drawing is available for framing. Kindly mail your request on company letterhead.



WORKMEN

MORGAN EQUIPMENT

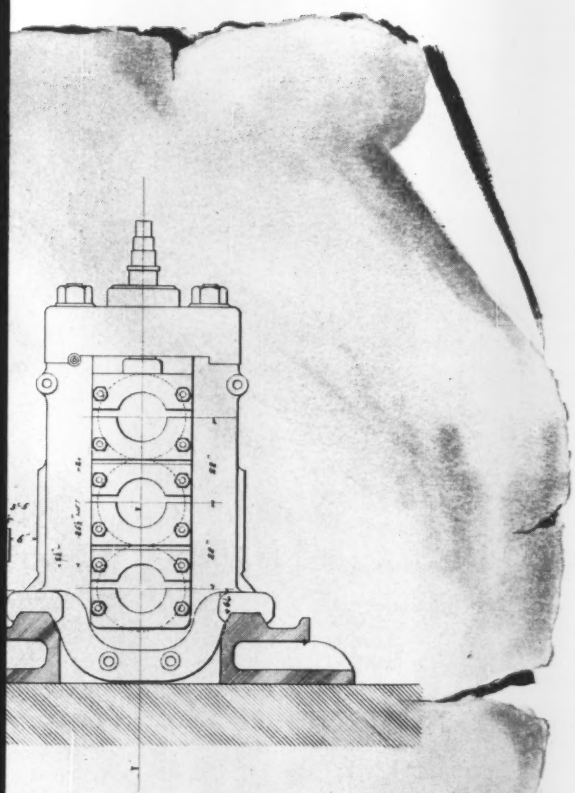


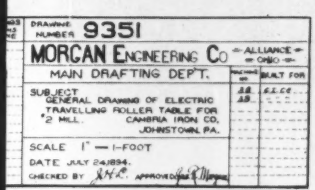
Models of Morgan equipment are set up in the classroom. An apprentice who will work on a giant 500-ton ladle crane learns how his job will influence the crane's overall performance.

Today, a large percentage of the skilled craftsmen, engineers and supervisors responsible for the construction of Morgan cranes and mill equipment are graduates of our own training program. Morgan Engineering's nationally recognized apprentice program provides 4 years (8400 hours) of carefully planned and supervised shop and classroom training. Applicants far outnumber openings. We are able to select men with the most desirable attitudes and aptitudes for exacting work . . . to develop their skills and a keen sense of responsibility for the overall performance of every Morgan-built product.

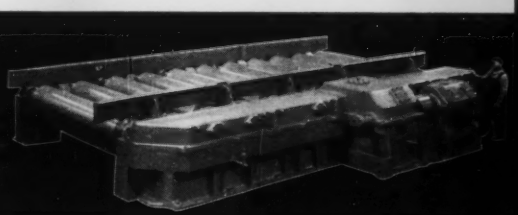
Morgan Engineering's apprentice program was started in 1890 . . . to develop *real craftsmen* who would safeguard our reputation for carefully controlled quality in every detail of design and construction. This kind of far-sighted planning is one of the reasons why industry has always been able to rely on Morgan equipment for efficient, dependable, long-lived performance . . . in cranes, mills, roller tables, shears, saws, presses and other Morgan products which are handling the big jobs and the tough ones.

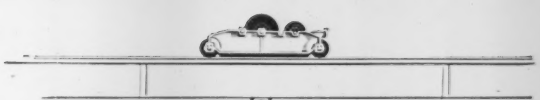
Let our representative show you how to speed production and lower costs with equipment designed and built by Morgan.





Apprentices see all types of custom-built equipment on Morgan's huge erection floor. Shown, a back mill table for a slabbing and blooming mill.





THE
MORGAN
ENGINEERING CO. *Alliance, Ohio*

Overhead Electric Traveling Cranes
Gantry Cranes • Open Hearth Special Cranes
Plate Mills • Blooming Mills • Structural Mills
Shears • Saws and Auxiliary Equipment

SPECIALIZED RESEARCH

This expansion test illustrates why the special composition developed for Kaiser Periclase Chrome brick assures better end wall service.

To show the effect of steel plates on permanent growth, two typical pre-fired brick with steel plates on four sides were laid up to form the side-walls of a test furnace. This furnace was heated with gas to 3100°F., ± 25°, and held there for 16 hours.

After cooling, the bricks were measured for comparative permanent growth. The effects shown were solely of the heating and iron oxide reaction. The chrome-magnesite type (upper row) showed an average 9% permanent linear growth; Kaiser Periclase Chrome (lower row) grew an average of only 1.4%.

This test demonstrates one of the many ways that Kaiser Chemicals research continuously proves—and improves—specialized products for better service to the steel industry.

PRODUCT SPECIFICATION

Compare these specifications to those of any other end wall brick . . . and the comparison will tell you why more and more open hearth operators specify Kaiser Periclase Chrome Brick—long respected for its consistent high quality and consistent high performance values:

1. Greatly increases end wall life when needed, or 2. Cuts costs with thinner walls when end wall service is balanced.

1. CHEMICAL ANALYSIS: (Typical)

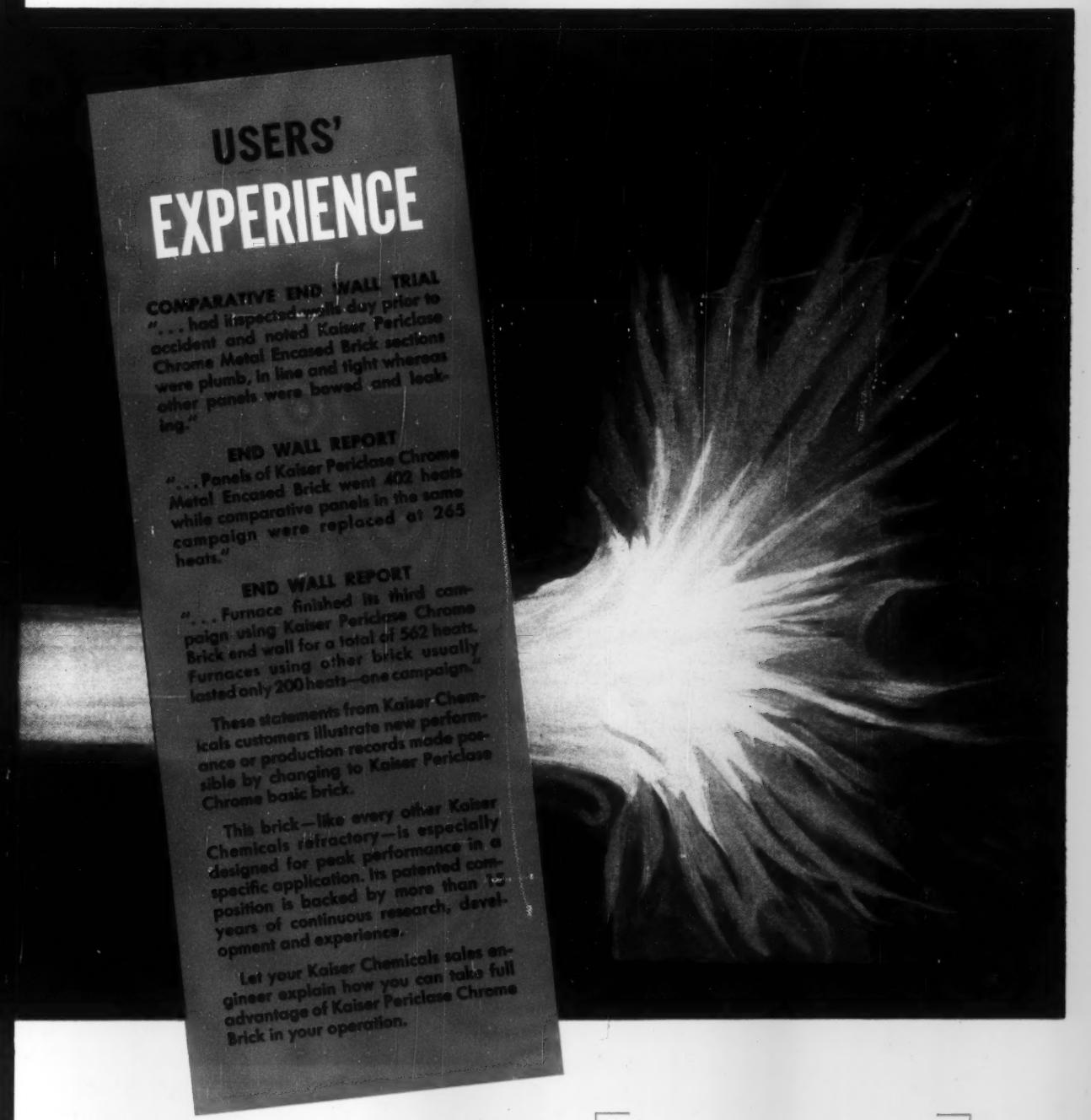
	Chemically Bonded	Burned
Loss on Ignition	3.7%	0.0%
Cr_2O_3	1.0	1.0
SiO_2	8.4	8.7
CaO	9.1	9.4
Cr_2O_3	4.5	4.7
Fe_2O_3	7.9	8.2
Al_2O_3	65.4	68.0
MgO (by difference)	100.0	100.0

2. PHYSICAL PROPERTIES: (Typical)

REFRACTORINESS: Hot Load Test (sheer Temp. @ 25 lbs./sq. in.)	3090°F	3090°F
Deformation, @ 25 lbs./sq. in., ½ hr. @ 3000°F	**	3–3%
P.C.E. Value	over 42	over 42
VOLUME STABILITY: Shrinkage (no load)		
Linear, % (after firing to 3000°F 5 hrs.)	**	0%
Linear Coefficient of Reversible Expansion (in./in./°F) (80-2730°F)	*	6.25×10^{-6}
Reversible Thermal Expansion @ 2730°F	**	1.7%
POROSITY: Apparent	—	20.5%
True	7.5%	21.5%
DENSITY: Bulk, lbs./cu. ft.	187	179
Av. Wt. of 9" x 4½" x 3" Straight, lbs.	12.9	12.6
STRENGTH: Crushing strength, lbs./sq. in.	9,000	5,000
MEAN SPECIFIC HEAT: (Btu/lb./°F)	**	0.264

*Figure not constant over temperature range.
**No value applicable. Brick is burned in test.

All three show why you get superior with Kaiser Periclase Chrome


USERS'
EXPERIENCE
COMPARATIVE END WALL TRIAL
"... had inspected walls day prior to accident and noted Kaiser Periclase Chrome Metal Encased Brick sections were plumb, in line and tight whereas other panels were bowed and leaking."
END WALL REPORT
"... Panels of Kaiser Periclase Chrome Metal Encased Brick went 402 heats while comparative panels in the same campaign were replaced at 265 heats."
END WALL REPORT
"... Furnace finished its third campaign using Kaiser Periclase Chrome Brick end wall for a total of 562 heats. Furnaces using other brick usually lasted only 200 heats—one campaign."
These statements from Kaiser Chemicals customers illustrate new performance or production records made possible by changing to Kaiser Periclase Chrome basic brick.
This brick—like every other Kaiser Chemicals refractory—is especially designed for peak performance in a specific application. Its patented composition is backed by more than 15 years of continuous research, development and experience.
Let your Kaiser Chemicals sales engineer explain how you can take full advantage of Kaiser Periclase Chrome Brick in your operation.

end wall service Basic Brick

Call or write Kaiser Chemicals Division, Dept. S7252, Kaiser Aluminum & Chemical Sales, Inc., at any of the regional offices listed below:

PITTSBURGH 22, PA. . . 3 Gateway Center
HAMMOND, IND. . . 518 Calumet Building
OAKLAND 12, CALIF. . . . 1924 Broadway

CHEMICALS KAISER REFRACTORIES

Kaiser Chemicals

Pioneers in Modern Basic Refractories

REFRACTORY BRICK & RAMMING MATERIALS • CASTABLES & MORTARS • MAGNESITE • PERICLASE • DEADBURNED DOLOMITE • ALUMINAS

SPECIALIZED RESEARCH

This expansion test illustrates why the special composition developed for Kaiser Periclase Chrome brick assures better end wall service.

To show the effect of steel plates on permanent growth, two types of pre-fired brick with steel plates on four sides were laid up to form the side-walls of a test furnace. This furnace was heated with gas to 3100°F., ± 25°, and held there for 16 hours.

After cooling, the bricks were measured for comparative permanent growth. The effects shown were solely of the heating and iron oxide reaction. The chrome-magnesite type (upper row) showed an average 9% permanent linear growth; Kaiser Periclase Chrome (lower row) grew an average of only 1.4%.

This test demonstrates one of the many ways that Kaiser Chemicals research continuously proves—and improves—specialized products for better service to the steel industry.

PRODUCT SPECIFICATION

Compare these specifications to those of any other end wall brick . . . and the comparison will tell you why more and more open hearth operators specify Kaiser Periclase Chrome Brick—long respected for its consistent high quality and consistent high performance values:

1. Greatly increases end wall life when needed, or 2. Cuts costs with thinner walls when end wall service is balanced.

1. CHEMICAL ANALYSIS: (Typical)

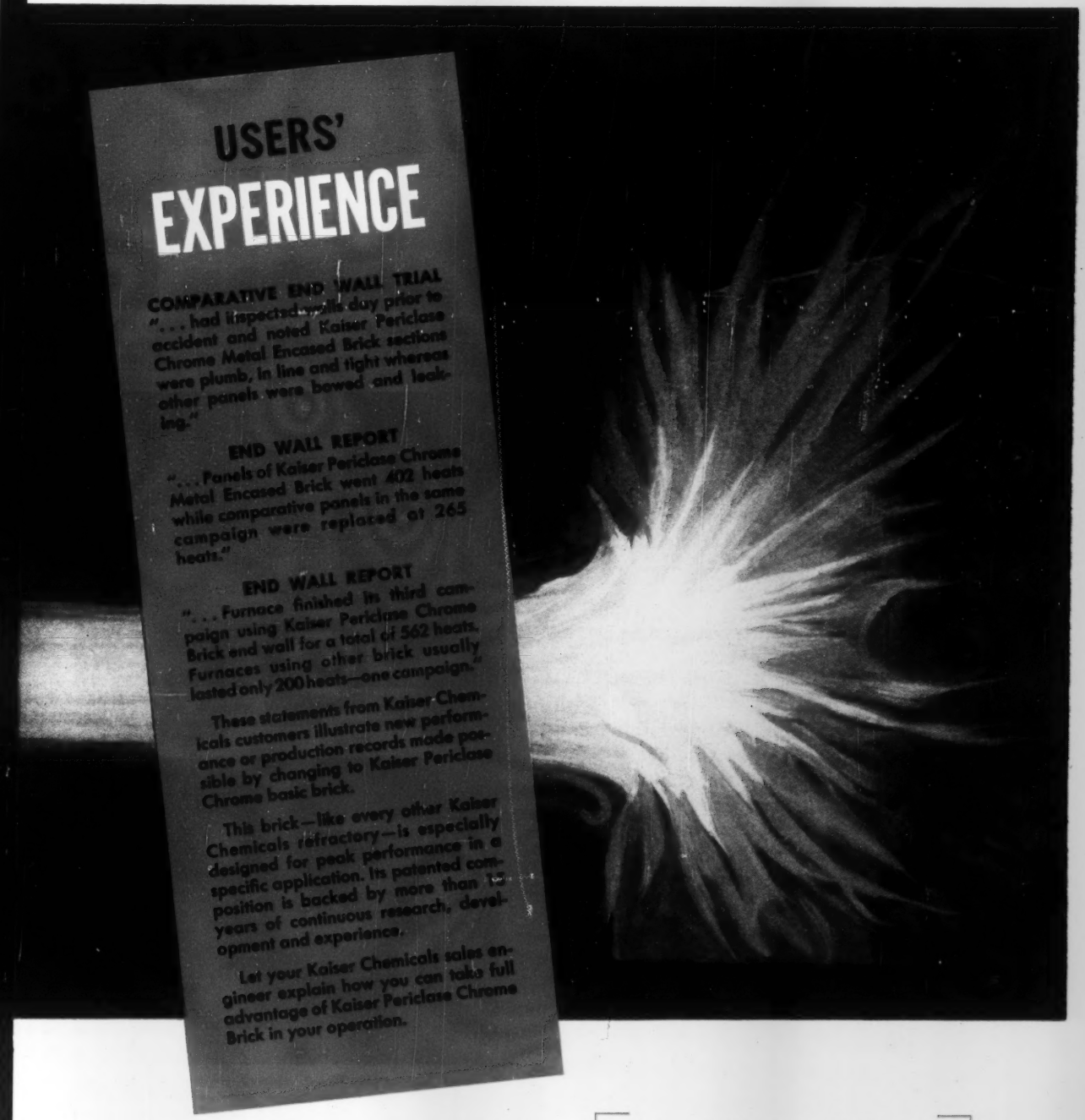
	Chemically Bonded	Burned
Loss on Ignition	3.7%	0.0%
CaO	1.0	1.0
SiO_2	8.4	8.7
Cr_2O_3	9.1	9.4
Fe_2O_3	4.5	4.7
Al_2O_3	7.9	8.2
MgO (by difference)	65.4	68.0
	100.0	100.0

2. PHYSICAL PROPERTIES: (Typical)

REFRACTORINESS: Hot Load Test (shear Temp. @ 25 lbs./sq. in.)	3090°F	3090°F
Deformation, @ 25 lbs./sq. in., ½ hr. @ 3000°F	**	3–5%
P.C.E. Value	over 42	over 42
VOLUME STABILITY: Shrinkage (no load) Linear, % (after firing to 3000°F 5 hrs.)	**	0%
Linear Coefficient of Reversible Expansion (in./in./°F) (80-2730°F)	*	6.25×10^{-6}
Reversible Thermal Expansion @ 2730°F	**	1.7%
POROSITY: Apparent	—	20.5%
True	7.5%	21.5%
DENSITY: Bulk, lbs./cu. ft. Av. Wt. of 9" x 4½" x 3" Straight, lbs.	187 12.9	179 12.4
STRENGTH: Crushing strength, lbs./sq. in.	9,000	3,000
MEAN SPECIFIC HEAT: (85-1830°F) (Btu/lb./°F)	**	0.264

*Figure not constant over temperature range.
**No value applicable. Brick is burned in test.

All three show why you get superior with Kaiser Periclase Chrome


USERS'
EXPERIENCE
COMPARATIVE END WALL TRIAL
". . . had inspected this day prior to accident and noted Kaiser Periclase Chrome Metal Encased Brick sections were plumb, in line and tight whereas other panels were bowed and leaking."
END WALL REPORT
". . . Panels of Kaiser Periclase Chrome Metal Encased Brick went 402 heats while comparative panels in the same campaign were replaced at 265 heats."
END WALL REPORT
". . . Furnace finished its third campaign using Kaiser Periclase Chrome Brick end wall for a total of 562 heats. Furnaces using other brick usually lasted only 200 heats—one campaign."
These statements from Kaiser Chemicals customers illustrate new performance or production records made possible by changing to Kaiser Periclase Chrome basic brick.
This brick—like every other Kaiser Chemicals refractory—is especially designed for peak performance in a specific application. Its patented composition is backed by more than years of continuous research, development and experience.
Let your Kaiser Chemicals sales engineer explain how you can take full advantage of Kaiser Periclase Chrome Brick in your operation.

end wall service Basic Brick

Call or write Kaiser Chemicals Division, Dept. S7252, Kaiser Aluminum & Chemical Sales, Inc., at any of the regional offices listed below:

PITTSBURGH 22, PA. . . 3 Gateway Center
HAMMOND, IND. . . 518 Calumet Building
OAKLAND 12, CALIF. . . . 1924 Broadway

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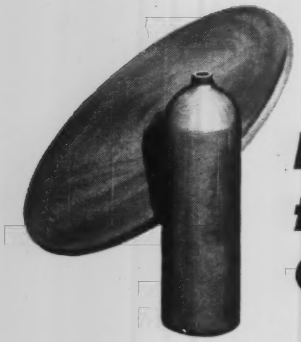


Flat Blanks to Finished Cylinders...

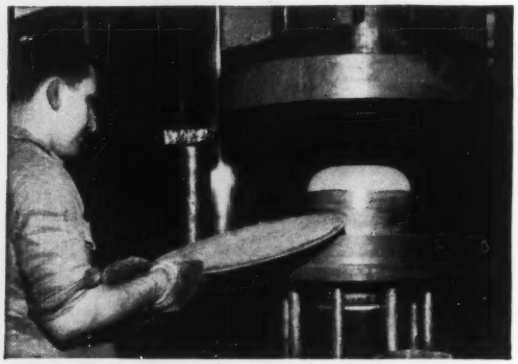
Higher Production Better Quality

one of the nation's foremost producers of cylinders for compressed gases —NORRIS-THERMADOR CORP.— uses Parker's aids to cold forming

The Bonderite and Bonderlube combination provides effective lubrication and acts as a non-metallic parting layer between work and dies. More severe deformations are possible, reducing the number of press operations and process anneals necessary. Die life is lengthened and surface finish improved.

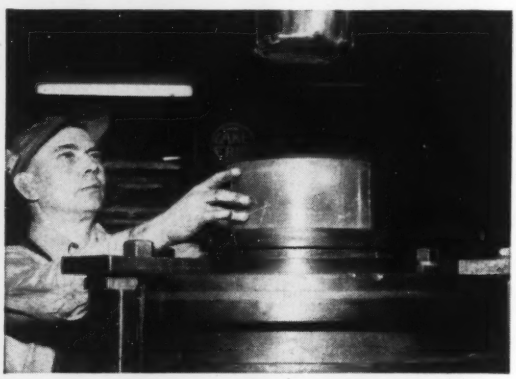
Bonderite and Bonderlube, by more efficient lubrication, help plants reach new production levels, get more efficient and economical production, and achieve better, more uniform quality.

Parker's cold forming experience in many plants and on many products is available to apply on your cold forming problems at once. Write or call today.



Cupping: Flat CO_2 cylinder blank, treated with Bonderite and Bonderlube, is changed into cylindrical form, with maximum of about 45% reduction in diameter of blank.

First reduction: Diameter of cup is made smaller and length increased without major change in wall thickness.



Second reduction: Final diameter of part with respect to length determines number of reductions required. Photos courtesy NORRIS-THERMADOR Corporation, Los Angeles, California.

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**Bonderite, Bonderlube, Parco, Parco Lubrite, Parker Pre-Namel—Reg. U.S. Pat. Off.*

CALENDAR
OF MEETINGS

Aug. 28-30, American Institute of Electrical Engineers: Pacific general meeting, Chinook Hotel, Yakima, Wash. Institute's address: 33 W. 39th St., New York 18, N. Y. Secretary: N. S. Hibshman.

Sept. 8-11, National Metal Trades Association: Eastern plant management conference, Essex-Sussex Hotel, Spring Lake, N. J. Association's address: 337 W. Madison St., Chicago 6, Ill. Secretary: Charles L. Blatchford.

Sept. 9-11, American Mining Congress: Metals mining and industrial minerals convention, Utah and Newhouse Hotels, Salt Lake City, Utah. Congress' address: 1102 Ring Bldg., Washington 6, D. C. Executive vice president and secretary: Julian D. Conover.

Sept. 9-12, Society of Automotive Engineers: Tractor meeting and production forum, Hotel Schroeder, Milwaukee. Society's address: 485 Lexington Ave., New York 17, N. Y. Secretary: John A. C. Warner.

Sept. 9-13, Instrument Society of America: Annual instrument - automation conference and exhibit, Public Auditorium, Cleveland. Society's address: 313 Sixth Ave., Pittsburgh 22, Pa. Executive director: William H. Kushnick.

Sept. 12-14, Automotive Parts Rebuilders Association: Annual meeting and exhibit, Congress Hotel, Chicago. Association's address: 220 S. State St., Chicago 4, Ill. Executive secretary: Jack O'Sullivan.

Sept. 17-18, Electronics Industries Association: National technical machine tool automation meeting, Ambassador Hotel, Los Angeles, Calif. Association's address: 1721 DeSales St. N.W., Washington 6, D. C. Secretary: James D. Secrest.

Sept. 17-20, American Die Casting Institute: Annual meeting, Edgewater Beach Hotel, Chicago. Institute's address: 366 Madison Ave., New York 17, N. Y. Secretary: David Laine.

Sept. 18-20, National Industrial Conference Board: Marketing meeting, Waldorf-Astoria Hotel, New York. Board's address: 460 Park Ave., New York 22, N. Y. Secretary: Herbert S. Briggs.

Sept. 20, Malleable Founders' Society: Fall meeting, Hotel Cleveland, Cleveland. Society's address: 1800 Union Commerce Bldg., Cleveland 14, Ohio. Executive vice president: Lowell D. Ryan.

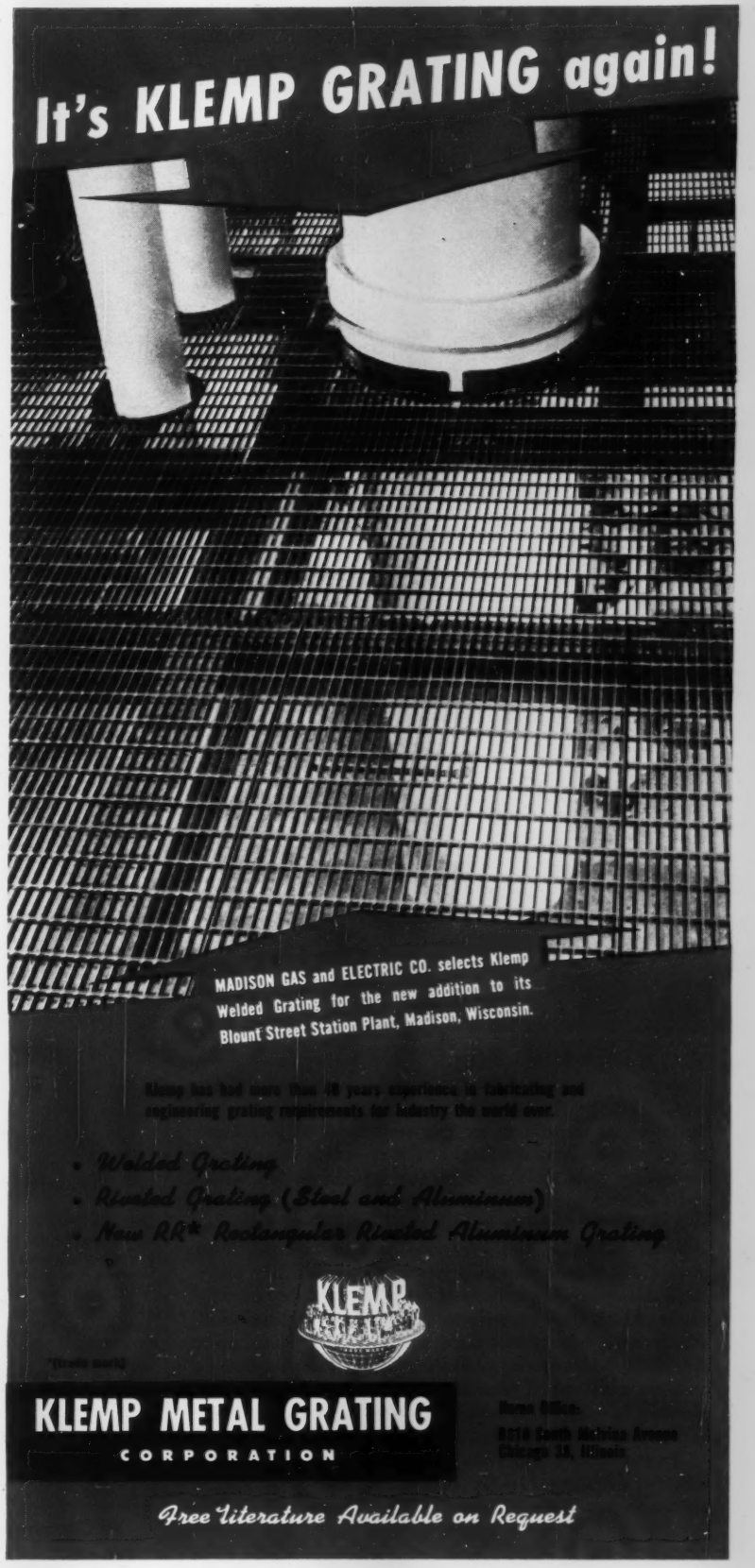
Sept. 21-24, Steel Founders' Society of America: Fall meeting, Homestead, Hot Springs, Va. Society's address: 606 Terminal Tower, Cleveland 13, Ohio. Secretary: George K. Dreher.

Sept. 22-24, American Machine Tool Distributors Association: Annual meeting, Hotel Cleveland, Cleveland. Association's address: 1900 Arch St., Philadelphia 3, Pa. General manager: James C. Kelly.

Sept. 22-25, American Institute of Wholesale Plumbing & Heating Supply Association Inc.: Annual meeting, Waldorf-Astoria Hotel, New York. Institute's address: 402 Albee Bldg., Washington 5, D. C. Executive secretary: George T. Underwood.

Sept. 23-25, American Society of Mechanical Engineers: Fall meeting, Hotel Statler, Hartford, Conn. Society's address: 29 W. 39th St., New York 18, N. Y. Secretary: C. E. Davies.

Sept. 23-26, Association of Iron & Steel Engineers: Annual convention, Penn Sheraton Hotel, Pittsburgh. Association's address: 1010 Empire Bldg., Pittsburgh 22, Pa. Managing director: T. J. Ess.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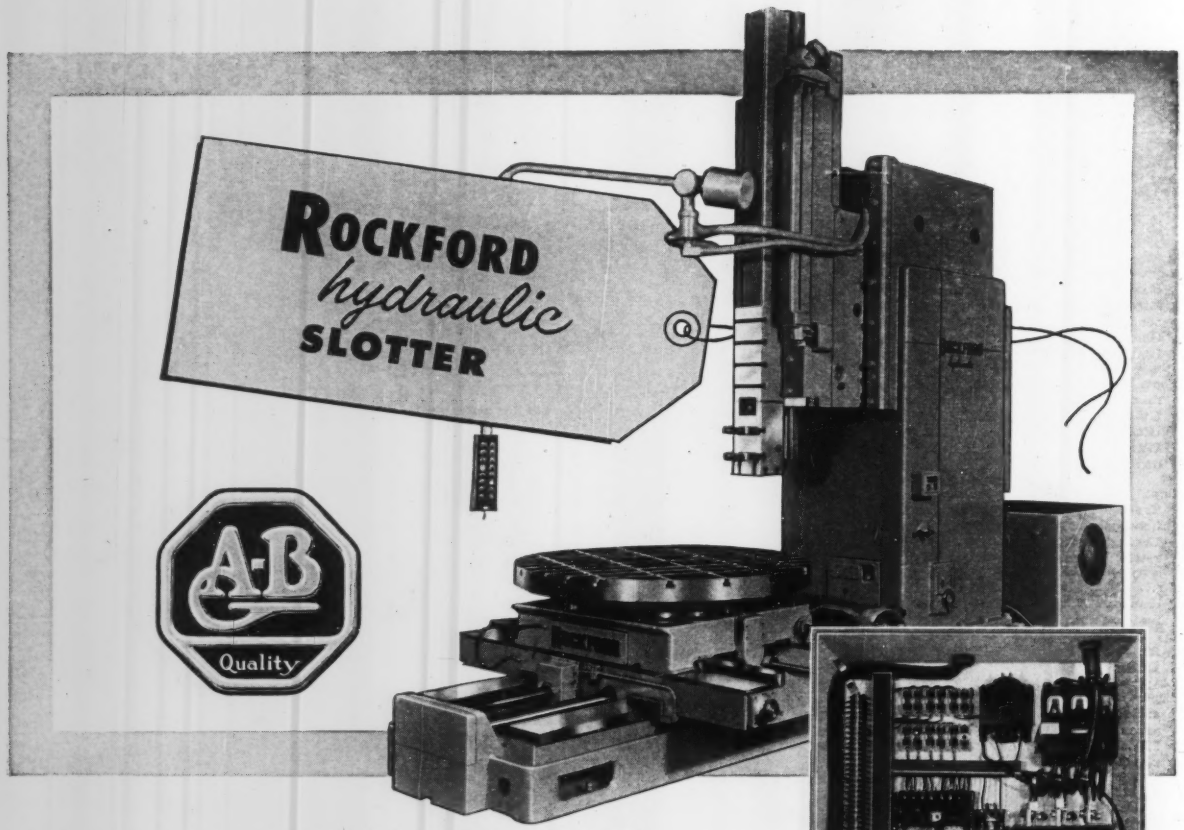
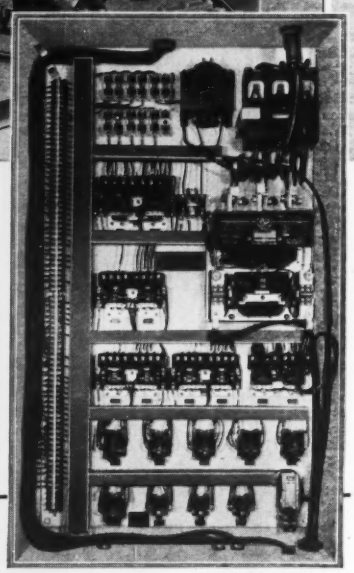


FACTORY EQUIPPED with ALLEN-BRADLEY Motor Control

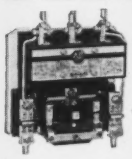
Without its "electrical brain"—the motor controls—your modern machine would hardly be a production tool. The special control panel starts, stops, and reverses its motors in proper sequence, at just the right instant. And the higher the speeds, the more necessary it is that each motor be controlled with split-second accuracy.

For modern, high speed production machines, Allen-Bradley is the *preferred* motor control. The reason for this leadership lies in the reliability and uniform operating speeds of all Allen-Bradley control units. Allen-Bradley solenoid relays, contactors, and starters have only one moving part. There are no bearings to corrode and stick. This simple design assures millions of trouble free operations. And the double break, silver alloy contacts . . . used on all Allen-Bradley controls...never need service attention.

To make sure that your machine tools are free from control failures, specify Allen-Bradley—you will never regret *this* decision!



Special control panel uses standard Allen-Bradley units listed in A-B Handy Catalog.



Bulletin 709, Size 4 Across-the-Line Starter. These starters are made in 8 sizes up to 300 hp, 220 v; 600 hp, 440-550 v.

Bulletin 800T Oiltight Control Units

Raised "STOP" Button

Push to Test Pilot Light

Three Position Selector Switch

ALLEN-BRADLEY
MOTOR CONTROL
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Allen-Bradley Co., 1320 S. Second St., Milwaukee 4, Wis.
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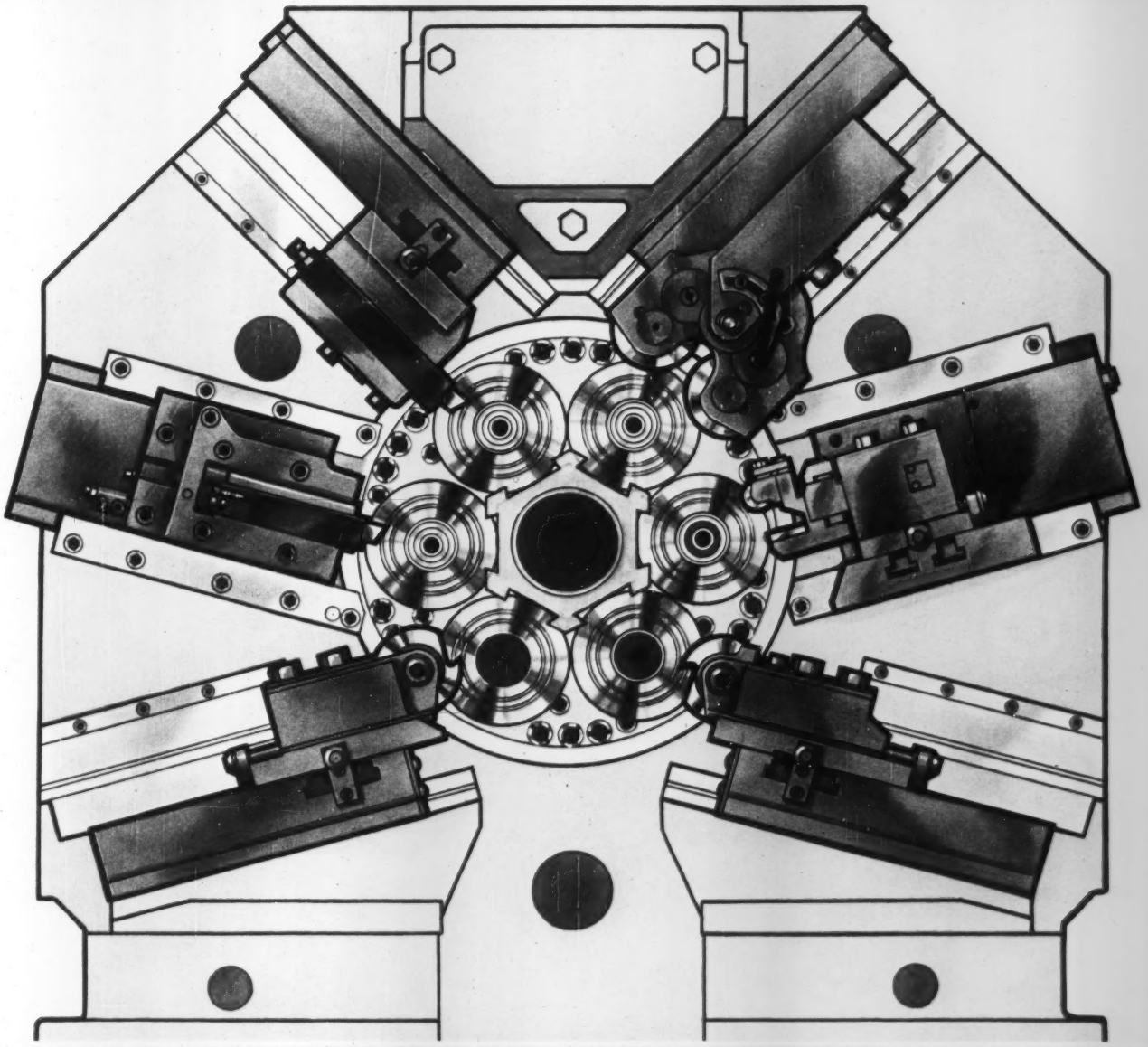
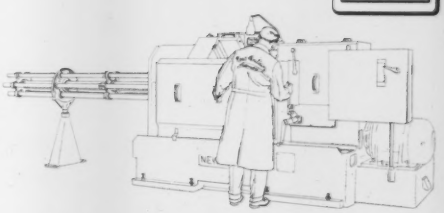
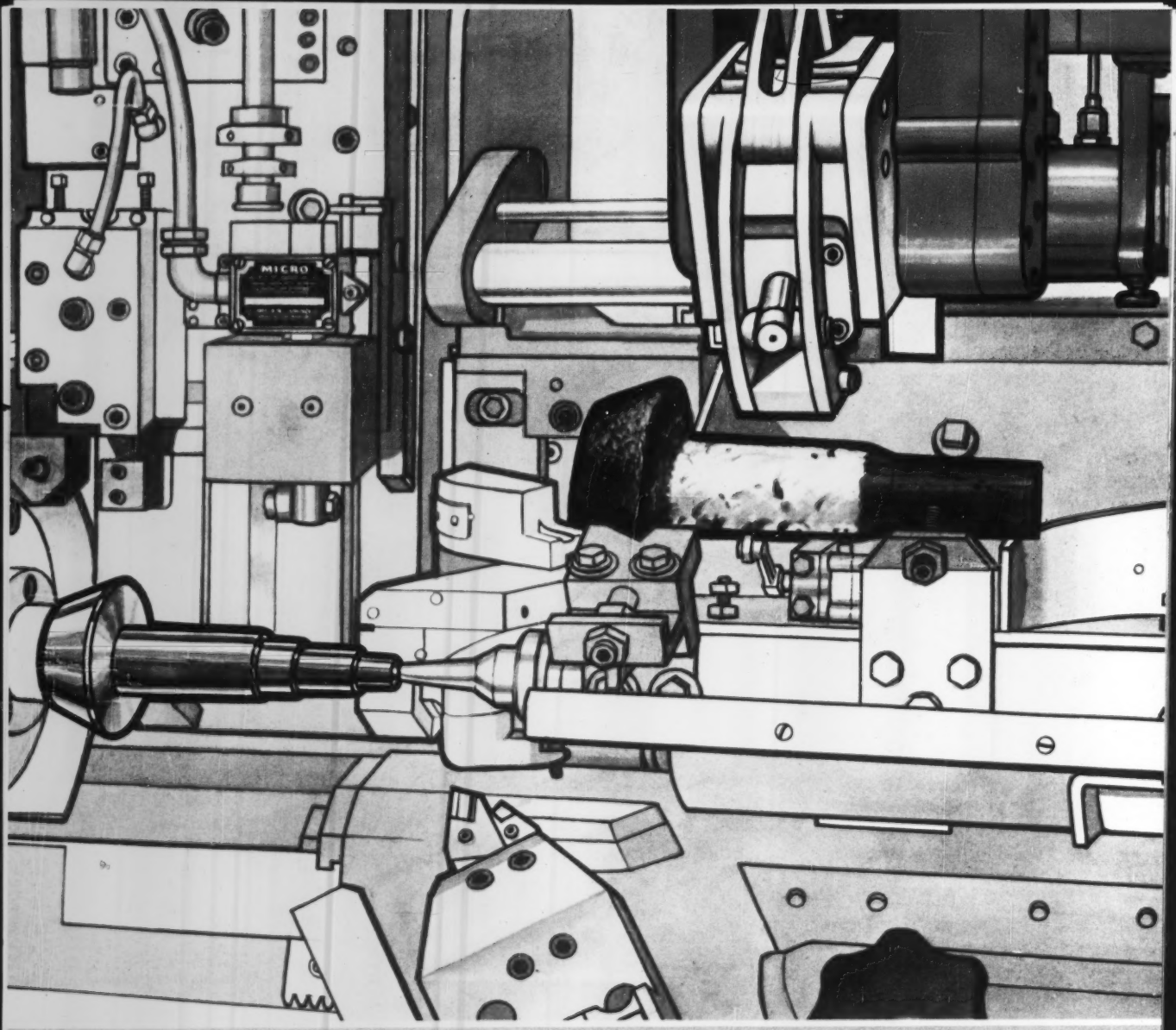


six spindles — six cross slides

Here you see the possibilities for new flexibility of bar machine set-ups with *a cross slide in every position.* Six independent cross slides. More operations on one bar machine. Six independent radial cross slides for forming, roll threading, shaving, skiving, angular facing, knurling, hobbing and undercutting with simpler tools and attachments, through the use of cross slides. The New Britain Machine Company, New Britain-Gridley Machine Division, New Britain, Connecticut.



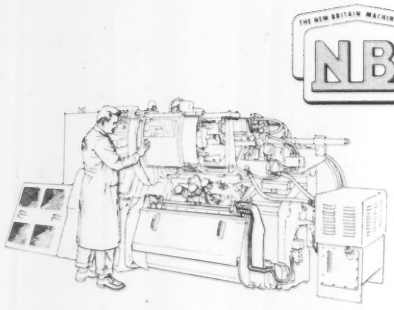
Automatic Bar Machine



no hands — no headaches

Automatic loading of forgings, bar slugs and bar stock is a basic optional design feature of New Britain **+GF+** Copying Lathes. It saves labor and makes a substantial reduction in production time per piece.

Positive, accurate loading, single point tooling and template control mean fewer headaches and larger profits on your lathe work. The New Britain Machine Company, New Britain-Gridley Machine Division, New Britain, Connecticut.

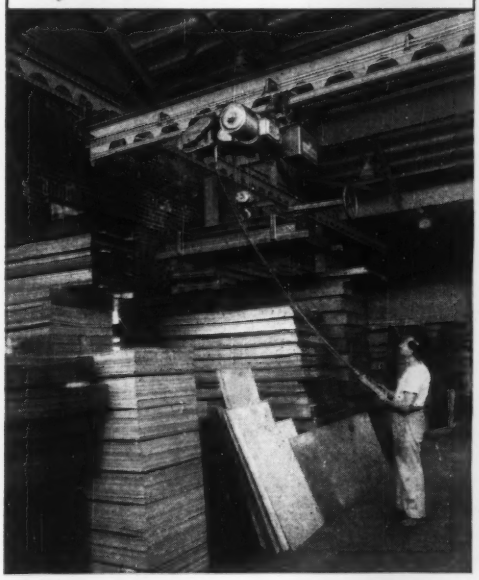


New Britain **+GF+** Copying Lathe

TRANSFER CRANES ***SIMPLIFY*** Sheet Steel Handling

It is easy to maintain a neat, orderly warehouse with this 5000 lb. capacity completely motorized transfer crane system. (Many warehouses prefer 10,000 lb. systems which enable the handling of 5-ton packages of steel, unbroken as they come from the mill.)

No trick at all to pile the heavy sheets high with a Tramrail crane and hand-operated grab.



TWO cranes on adjacent runways cut the cost of handling sheet steel in the modern warehouse of Eastern Steel Products, Ltd., Toronto. They enable one man to handle heavy packs quickly and make it easy to maintain orderliness.

The Tramrail System permits far more steel being stored in the building because it can be piled high and because wide aisleways required for floor conveyances are not necessary; thus, much of this space can be used for storage.

The overhead Tramrail cranes are always on the job, always within easy reach. They require extremely little maintenance, usually far less than needed for power-driven floor trucks. Further, there is no floor wear with cranes and this alone represents a considerable savings.

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Metalworking Outlook

Question of the Week

What's the validity of the labor argument that wage hikes don't bring price increases? United Auto Worker President Walter Reuther's price-cutting proposal appears to be a tacit admission that pay raises do raise prices. Mr. Reuther's headline-catching scheme would have the auto companies cut 1958 model prices $100. If they do it, the UAW "will give consideration to the effect of such reduction in the drafting of our 1958 demands." Note that there was no offer to reduce present wages commensurate with a cut in car prices. Although the Reuther move is a "cynical publicity stunt," as auto executives rightly call it, it has been a spectacular one.

McClellan To Quiz Reuther

Will Walter Reuther be quizzed by the Senate McClellan committee? Yes, but not until late this year or early next when bargaining time is nearer in the auto industry. The emphasis with Mr. Reuther will be on his use of power, not corruption. Likely questions: How does he raise strike funds? What about violence and secondary boycotts in the Kohler strike? How does he influence state and local elections?

Wage Pacts Up

Wage settlements negotiated in the first six months by AFL-CIO unions average 1 to 3 cents higher than comparable agreements last year. Bulk of the pacts have been for 10 or more cents per hour, with over one-third for 13 or more cents per hour. Only 15 per cent were for 6 cents or less. In the construction industry, major settlements have been 15 to 20 cents an hour. At the other extreme, about 5 per cent of settlements, principally in textiles, provided no pay boosts.

6.2 Million Autos in '57

Look for the auto industry to produce about 6.2 million cars, both in calendar 1957 and for model year 1957. Calendar 1957 will be the third best in history, following 1955 (7.9 million) and 1950 (6.7 million). Both forecasts for 1957 are better than expected last spring when slow sales threatened summer production schedules. May, June, July, and August have been pleasant surprises, all substantially above year-ago months. Sales prospects aren't quite so rosy; the industry expects to end the '57 model year with 230,000 cars in dealers' stocks, 30,000 above normal.

Auto Part Business Good, Too

Auto replacement part sales this year will hit another record, besting the previous high set in 1956. The 65 million cars and trucks crowding American roads will require more than $4 billion worth of parts in 1957, not counting tires and labor costs. Higher prices account for some of the

gain, although total physical volume will rise by 1 per cent. Dollar volume has been running 5 per cent ahead of 1956's.

Missile Memo: Douglas Aircraft

Increasing missile business won't be enough to offset losses in manned aircraft contracts. Douglas Aircraft Co. Inc., for example, has more missile orders on the books than any other planemaker, but only about 10 per cent of its backlog is for missiles. In the entire aircraft industry, watch for the workforce of 910,000 to be reduced to 800,000 by yearend.

Missile Memo: Republic Aviation

Some 400 firms that are subcontractors to Republic Aviation Corp. may soon feel the effects of Defense Department cutbacks. Republic subcontracts about 20 per cent of its aircraft and missile business normally; in 1958, the figure will drop to 16 per cent. At least 45 of Republic's subcontractors look to that firm as their major source of business. Planned expenditures of $1 million for plant and equipment next year will be scaled downward.

Metalworking Earnings Rise

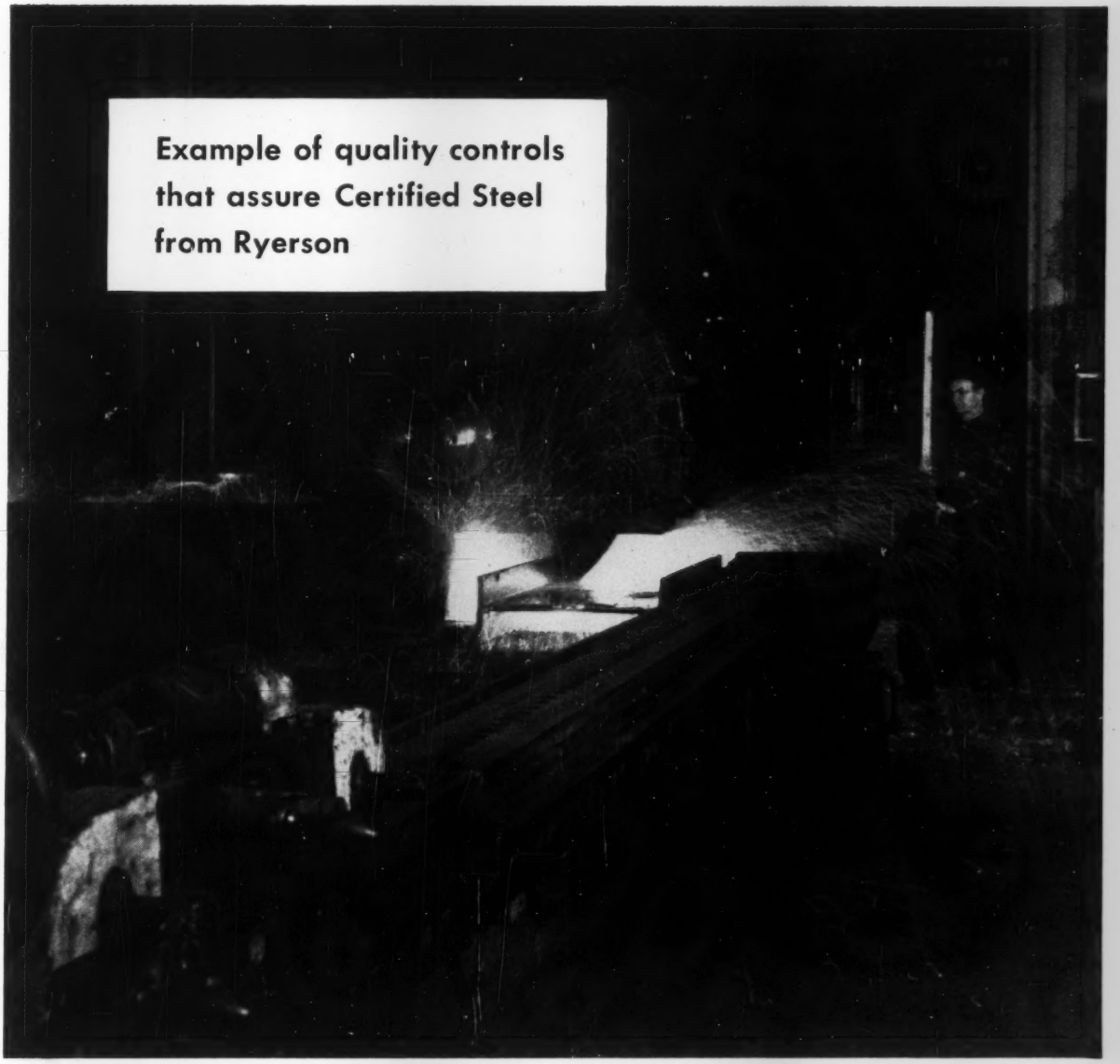
Reports for the first half by 741 companies show combined net income after taxes of about $6.2 billion, up 6 per cent from that of the same 1956 period, reports First National City Bank of New York. Increases reported: Iron and steel firms, 2 per cent; electrical equipment, 9 per cent; machinery, 8 per cent; other metal products, 17 per cent; automobiles and parts, 13 per cent; and other transportation equipment, 13 per cent. Total manufacturing earnings rose 7 per cent, the relatively good metalworking showing being offset by declines in chemical products, paper, and textiles. The total gain of 6 per cent is slightly below the manufacturing level because of dips in mining activities and only small gain among utilities.

How Long Will Kefauver Go On?

Sen. Estes Kefauver's (D., Tenn.) investigation of administered prices and economic concentration may fizzle out before the end of the year. The senator has not scored the points in hearings that he had hoped to make against the steel industry (see page 39). Testimony from Otis Brubaker of the United Steelworkers was pedestrian. Steel industry officials who testified have been well prepared. The interest of reporters from newspapers and wire services has waned.

Straws in the Wind

In the last seven years, the number of west coast screw machine product firms has increased 89 per cent, against a national average of 49 per cent . . . There's more aluminum in the world than any other basic metal, says Reynolds Metals Co. . . . At a Pittsburgh department store, U. S. Steel Corp. is displaying a home using 7 tons of steel (6 more than the average house).



Cuts 24″ beams in 12 seconds!

When this big friction saw cuts cold steel like hot butter it also completes one more step in the quality control of Ryerson steel.

A new method of blade alignment and an automatic gauge of our own design assure a remarkably straight, true cut—and frequent blade changes result in minimum burr!

This kind of control is typical of the exacting attention we give to every operation. As a result, we achieve far greater accuracy than called for in standard tolerance tables—almost without exception.

Certified cutting of Ryerson steel and the over-all control of Ryerson steel quality are important points to remember when you're specifying or buying steel from stock.

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1957 FORD FAIRLANE 500 SUNLINER

PHOTO: COURTESY FORD MOTOR COMPANY

DSC *RBF* STRIP Scoring 100% Job-Performance on '57 Ford Radiator Grilles, Repeating '56 Record

THE FACTS OF THE CASE—Continuing its '56 record, DSC *RBF* STRIP is giving two Ford vendors 100% job-performance in their production of '57 Ford front-end grilles . . . meeting all requirements for drawing quality and finish.

For the '57 grille the "specs" call for slit-edge coils, over 12" in width, .036" thick, No. 4 temper, DSC *RBF* bright finish suitable for chrome plating. As each blank weighs over five pounds, the requirements run to millions of pounds.

AS A MANUFACTURING MAN—We believe you would appreciate the workmanship and appearance of these grilles . . . how each half section, right and left, is drawn in one "shot" to make the frame, the lattice-work grid (of continuous-channel design), and the recesses for the turn signals. The sections are then chrome plated and assembled.

Simple? Yes . . . when the gauge is tight, the temper right and the finish "deep-rolled" bright for mass-production plating . . . PLUS the die-making and production skills of the Ford vendors. *

AS A VALUE-WISE BUYER—Wouldn't you say that a case history like this one shows (1) that DSC *RBF* STRIP is *profitable* to the users; (2) that it keeps their over-all job-costs *competitive;* (3) that DSC SERVICE helps two major vendors meet Ford standards for product quality and for closely-timed production and shipping schedules?

There may be profit possibilities in your own use of DSC RBF "deep-rolled" STRIP . . . or other DSC PRODUCTS and SERVICES. For complete information check with your nearest DSC Customer "Rep." You'll get immediate action on your inquiry.

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Basic OH Steel Ingots • Blooms • Slabs • Billets • Rods
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Manufacturers' Wire • High Carbon Specialty Wire • Aluminum Cable Steel
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MILL DIVISION: DETROIT, MICH., HAMDEN, CONN.

Cold Rolled Carbon Steel Strip
Flat Cold Rolled Carbon Spring Steel

DSC General Office will supply the names if requested on your company letterhead

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DETROIT STEEL CORPORATION

GENERAL SALES OFFICE, DETROIT 9, MICHIGAN

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An Urgent Matter

Do you have any idea how much labor unions are getting away with?

In a study called "The Legal Immunities of Labor Unions," Roscoe Pound, professor emeritus of the Harvard University Law School, draws this alarming word picture:

"The general privileges and immunities of labor unions, their members, and officials (allow them) to commit wrongs to person and property . . . to interfere with the use of highways . . . to break contracts . . . to deprive individuals of the means of earning a livelihood . . . to control the activities of individual workers and their local organizations by national organizations beyond the reach of state laws . . . and to misuse union trust funds . . . (They are) things which no one else can do with impunity."

Such freedom is patently wrong. As Dean Pound says: "Immunities relieving particular persons or special classes or groups from duties and liabilities . . . have been regarded from of old as odious."

He points out that through legislation organized labor enjoys special privileges today which kings and governments had, but lost, years ago. They stem from:

"1. The substantial elimination, as against labor organizations, of . . . the assured method of enforcing the law applicable to everyone else.

"2. The refusal of labor organizations to be treated as legally responsible . . . by becoming incorporated. . .

"3. Not distinguishing unlawful action by labor organizations, their leaders and their members, done outside the employer-employee relation, from practices in that relation.

"4. Committing all matters affecting labor organizations to an administrative agency instead of confining its jurisdiction to matters involved in the employer-employee relation."

Dean Pound leaves no doubt that he believes the immunities of labor unions and labor leaders should be eliminated. Of course, we agree, but what worries us even more than the situation he describes is the apathy with which studies such as Dean Pound's are generally received: We are momentarily disturbed but fail to follow through.

In this case, we have no excuse. The spotlight is on labor unions now. Now is the time to act. Write your congressmen. Let them know where you stand.

Irwin H. Such
EDITOR-IN-CHIEF

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Supplemental Unemployment Benefits:

Funds in Good Shape

Company and Fund	Market Value (millions)	Benefits Paid (millions)	Funding Position (% of maximum)
General Motors Corp.	$71.9	$2.56	57.02
Ford Motor Co. (total)	29.7	1.069	
. . . general fund	28.3	1.064	52.13
. . . defense workers' fund	1.4	0.005	49.36
Chrysler Corp. (total)	17.845	2.062	
. . . general fund	15.9	2.008	45.22
. . . defense workers' fund	0.345	0.044	83.04
. . . office workers' fund	1.6	0.010	55.31

As of July 1, 1957.
Source: UAW.

Hassle Looms Over SUB

Union wants extended payments and easier eligibility. Management wants to simplify administration. They may settle on a joint administration program

OHIO'S REFUSAL to accept integrated unemployment payments overshadows the fact that SUB funds of the auto industry's Big Three alone total about $119 million.

Only about $5.7 million had been paid out in benefits at the end of June, but more payments are expected because auto unemployment has increased an estimated 35,000 since then.

The Michigan Employment Security Commission reports some 235,000 workers are laid off in that state. Most are UAW members eligible for SUB.

Hot Spot—James Tichenor, administrator of Ohio's Bureau of Unemployment Compensation, ruled last month that any supplemental benefits are considered wages and will be deducted from state compensation.

The ruling affects some 170,000 UAW members, plus another 320,000 workers who belong to other unions with similar plans.

Ohio's interpretation, calling SUB wages, is an administrative one. Indiana, North Carolina, and Virginia have statutes which forbid such payments. The UAW has tried several systems of lump sum payments to get around the Ohio ruling, but none has succeeded.

Mr. Reuther flatly says: "We will challenge this ruling. We are confident the basic justice of the SUB plans will be upheld." The 44 states which have agreed to SUB tend to throw the balance in his favor.

Buildup — Jobless figures are lower than last year's when unanticipated layoffs decimated SUB funds before they could build up. Now there's plenty of money in the kitty; funds stand at above half maximum (see chart).

Targets — Walter Reuther's troops see this surplus as an argument for extending payments and lowering eligibility requirements.

The union is citing examples of how SUB is working. Ford Motor Co.'s Somerville, Mass., plant is a typical case. In mid-April, it was closed for the switch from Ford assembly to manufacturing Edsel parts. Some 1300 workers were laid off until mid-July.

Massachusetts pays a maximum of $25 a week in unemployment compensation. Between 1100 and 1200 workers drew an additional $15 a week (average) from SUB, reports the union.

Most payments ran eight to ten weeks. Ken Bannon, national UAW Ford director, estimates only half a dozen cases will be appealed.

Holding Fire—Auto companies aren't discussing SUB until contract negotiations begin next year. Chrysler typifies the industry's cautious attitude when it says: "So far, there are no major

Here's How SUB Works

Supplemental Unemployment Benefits make up the difference between a laid-off worker's state compensation and 65 per cent of his takehome pay. (Or 60 per cent after four weeks.)

Here are the basic steps:

1. Trust Fund: Auto companies pay into these funds at the rate of 5 cents per man per hour. At maximum, funds will equal about $400 per worker.
2. Credits: Workers earn credit units at the rate of one every four workweeks if they have less than ten years' seniority, one every two weeks if they have more than ten years on the job. No more than 26 credits may be accumulated.
3. If a man is laid off and is eligible, he may exchange a prorated number of credits for one week of SUB. He may have as many weeks of benefit payments as his credit units will cover. Seniority and trust fund position determine the number of credits exchanged.

problems and few appeals."

In March, when layoffs were low, Chrysler paid out less than $10,000 in benefits. It doesn't discuss the bad months like August when payments are at least triple that amount.

Sore Spot—Neither the automakers nor the union seem eager to talk about administration of the SUB programs (funds come out of SUB payments).

Some sources put administration cost at well over $1 million annually for each of the Big Three. And Chrysler, for example, won't even tell how many persons are employed to administer the program.

Changes Ahead — With SUB funds building up and with administration posing problems, changes are expected for '58. The union is satisfied that 5 cents per man per hour will bring in enough money, but it wants its use liberalized.

One industrial relations man figures the union will aim for a joint administration setup so it can apply pressure to invest SUB funds in such programs as low cost housing. Two suppliers' contracts, recently signed, indicate other items the UAW might like to see put through among the car builders.

Variations—Doehler Jarvis Div., National Lead Co., Toledo, Ohio, has a plan by which workers in its Michigan and Pennsylvania plants collect SUB simply by sending a form to the company.

Up to now, each worker had to show up in person with state unemployment check in hand to prove eligibility.

National Malleable & Steel Castings Co., Cleveland, has a divided fund system. Three cents goes into a company fund and 2 cents into a plant fund. Money from plant funds is drawn out first. If necessary, the company funds are tapped.

This is a variation of auto plans (such as Chrysler's) which have general, hourly, and defense funds. It protects workers such as office employees who seldom strike, or people in special circumstances on defense projects.

No Strain — These types of changes, plus others dealing with eligibility, aren't apt to be too strongly contested by the auto companies.

But clauses concerning length of payments (UAW wants 52 weeks), guaranteed severance pay, and no limit on putting money into the funds will draw fire.

So will any plans which tend to make administration more complicated. For that reason, observers today feel skilled workers' aims won't get too big a hearing.

Out of Luck—Skilled workers (who are seldom unemployed) generally are unhappy with SUB. They would rather have the 5 cents an hour added to their pay.

The UAW will be eager for this concession to placate the skilled workers Walter Reuther has been trying to woo.

Furnace Rolled Into Place

The largest recent moving project in the Buffalo area covered only 100 ft., the distance required to move Republic Steel's new 2000-ton heating furnace into position. It was completely built off the site, cutting normal replacement downtime by more than two months.

The old heating furnace continued to serve the 14-in. bar mill until three weeks before the new one was ready. It was then dismantled.

The new furnace was built on hundreds of 2.75-in. steel rollers. Embedded into the foundation were four, 12 in., H beam skids leading to the new site.

New Battery Is Pushing Coke

The eighteenth coke battery to be rebuilt since World War II at U. S. Steel Corp.'s Clairton (Pa.) Works is in production.

Soon two more will be readied. (The work is being done by Allied Chemical & Dye Corp.'s Wilputte Coke Div.) When they are producing, the Clairton Works will have rebuilt all but three of its 23 batteries since 1945. Each new battery has 64 ovens.

Stromberg-Carlson Co. produces both package sets and components

Metalworking Hears Music

High-fidelity sales are booming. Producers of components and package sets alike expect the volume to rise higher. Metal producers like the sound of this musical market

THERE'S MUSIC for metalworking in high-fidelity equipment. "Hi-fi" is a multimillion-dollar symphony to suppliers of sets or their components.

Once a hobby, now an industry, hi-fi has growing pains. Each of two rival camps believes it is the "true" hi-fi industry. (Although there's no precise definition of the word, hi-fi means reproducing the full audio range of the original sounds.)

In This Corner—One camp, the "do-it-yourself" group, numbering over 100 manufacturers (many are small firms), supplies components to home hobbyists who assemble their own sets. Ordinary, helpless folk without mechanical ability can buy their equipment intact from a producer of package sets. Most set suppliers are large television or radio firms.

While the do-it-yourself vs. we-do-it-for-you squabble keeps competition keen, all manufacturers agree that their sales volume is turned up high.

Components—Producers of hi-fi components say sales totaled $166 million last year, compared with $12 million in 1950. Most look for a gain of 10 to 15 per cent this year.

Sets—Package set producers expect to sell 1.5 million units this year, compared with 90,000 in 1950 and 900,000 in 1956. Sales in '56 approached $350 million and may top $450 million in '57.

Proving that there's room for component and set producers alike in high-fidelity, Stromberg-Carlson Co., Rochester, N. Y., division of General Dynamics Corp., sells in both markets profitably. "We entered the high-fidelity console market last September and have built up sales of several million dollars. Our component sales have increased about 25 or 30 per cent each year. As a result of currently revamping our components, we expect a 60 to 75 per cent sales increase," say company spokesmen.

"Sales of our high-fidelity units have gained substantially and steadily and the outlook is considerably better than ever," adds Stan McKeeman, assistant to the director of merchandising, Magnavox Co., Ft. Wayne, Ind.

New Package Producer — More large corporations are planning to produce package sets. Westinghouse Electric Corp., Pittsburgh, introduced its first major high-fidelity line at a Chicago exhibition last month. Among manufacturers announcing accelerated sales promotion campaigns in hi-fi this year are Radio Corp. of America, New York; Admiral Corp., Chicago, and Motorola Inc., Chicago.

Interest in this thriving market isn't limited to U. S. firms. European competition is heavy. A West German firm, Blaupunkt, will distribute in the U. S. what it calls the world's first true hi-fi car radio.

Component Sales Up—Parts producers are also enthusiastic about sales prospects. "Our sales of amplifiers, turntables, arms, cartridges, and miscellaneous products have increased substantially in past years; we look for a large

increase in hi-fi sales," says R. G. Bach, sales manager, Fairchild Recording Equipment Co., Long Island City, N. Y.

"Hi-fi is growing; let there be no doubt about that," comments Robert Newcomb, Newcomb Audio Products Co., Hollywood, Calif. "The components field represents the backbone of the hi-fi market."

Looking Better — V. A. Miller, president, V-M Corp., Benton Harbor, Mich., says phonograph and tape recorder sales are growing rapidly. Record changer sales are steady. He predicts a 15 per cent gain in 1957.

Lawrence LeKashman, vice president, David Bogen Co. Inc., Paramus, N. J., reports his firm is expanding constantly in component production, adding tape recorders and transcription players.

"We've had substantial sales increases in loudspeakers every year since the end of World War II," says Thomas A. White, president, Jensen Mfg. Co., Chicago, division of Muter Co. "I believe our output will continue to grow."

Use Several Metals—The market outlook encourages metal producers, too. Newcomb encloses its products in steel cabinets. V-M buys zinc diecastings for frames. The core of David Bogen's transformers is steel. Aluminum producers are eyeing the industry with interest. These are only a few of the applications; a wide section of metalworking can share in this thriving industry.

Eaton Adds to Gear Division

Eaton Mfg. Co.'s Automotive Gear Div., Richmond, Ind., will add a 35,000 sq ft building, plus 2800 sq ft of office space, to its present facilities. Cost of new building and equipment: About $2 million. Expected employment increase: 100 to 150 persons.

Survey Notes Equipment Age

Fifty-eight per cent of the machine tools and metalforming equipment in use in Chicago plants is at least ten years old. Another 20 per cent is over 20 years old. Sidney Feuchtwanger, president, Commercial Discount Corp., said after a recent survey.

'Tadmu' Pays Off

A testing and development mockup, it has simplified the fabrication of large plating machines. The units also have been a sales aid for Wagner Bros. Inc.

A COMBINATION of aircraft lofting principles and machine tool building block units is paying off in modular buildups of plating machines for Wagner Bros. Inc., Detroit.

W. R. Nolf, plant manager of Wagner's equipment division, says: "The modular system makes for quicker engineering and fast fabricating. Our labor costs have been reduced 50 per cent, thus cutting total costs by at least one-sixth."

Starting Point—Heart of Wagner's system is a test and development mockup which company engineers call "Tadmu." It's an operating composite of all sections and devices found on plating machines.

Although the mockup primarily is used for testing and development, Mr. Nolf points out it has been a great sales aid. "Customers can come in and see the mockup in operation and pick out the units they want assembled in their own machines," he explains.

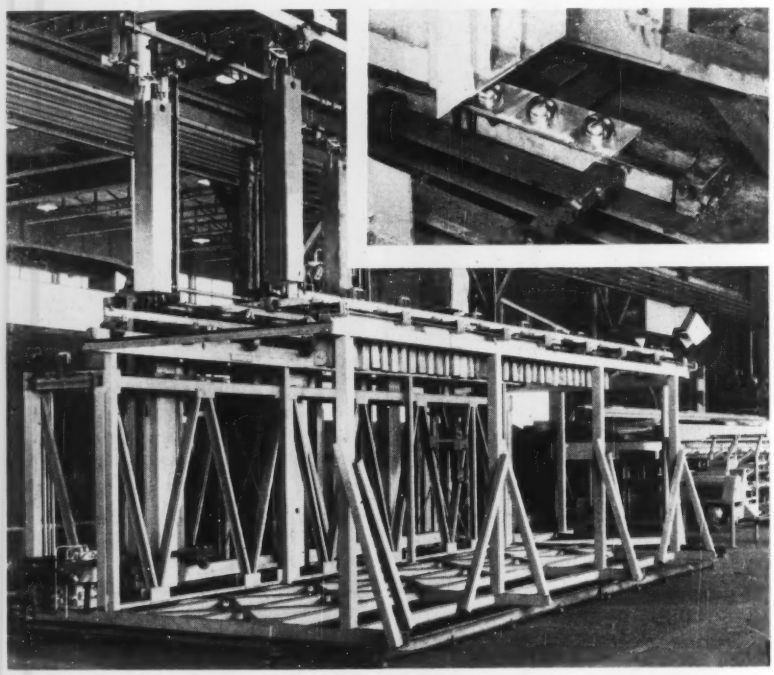
Blueprints are prepared after a customer decides what sections he needs.

Add Lofts—Detail prints of each section, scaled to 0.003 in., are taken from aluminum lofts similar to those used in the aircraft industry.

Engineers spot the sections they want on the lofts and combine them into a blueprint for the machine on order.

And Specs—Wagner has compiled a handbook listing specifications for each "Tadmu" unit. The corresponding specs are added to the prints.

"We can engineer our larger machines in about 350 hours com-



Customers use the plating machine mockup to select features for their installations. Inset shows ball bearing support

pared with the 1200 or 1300 hours it formerly took," says Daniel J. Borodin, chief engineer.

Weld Together — Construction also has been simplified by the use of standard subassemblies.

Precut structurals are placed on a 45-ft fixture and welded into modular sections. The fixture insures accurate fit and alignment of all parts of a plating machine carriage and frame.

Two men (instead of six) fabricate sections using this system. Welding time has been cut in half.

Include Specials — The testing abilities of "Tadmu" have been instrumental in refining several features.

- The mockup uses ball bearings instead of rollers to support the carriage.
- A hydraulic control unit for the elevators permits easy contact between work carriers and cathode rails. The elevator mechanism can pick up and lower an egg without breaking it.
- A compensating assembly makes it possible to space work racks automatically for high or low volume production runs. "This can result in a 20 per cent saving on chemicals," says Mr. Nolf.
- Automatically controlled pusher assemblies have been developed on "Tadmu." The pusher has a V notch which fits into a carrier key attached to the rack carrier bar. It gives a slight amount of leeway in centering. If the pusher bar doesn't catch, a flat edge on each side of the V contacts a limit switch which shuts off the motor.

Ship Out — The modular unit construction makes it possible to ship machines in easy-to-assemble sections. Setup takes days instead of weeks.

Delivery time for plating machines can be cut from three months to six or eight weeks.

Aircraft Exports Up

Exports of civil aircraft weighing 6000 lb or less increased 85 per cent in value during the first six months of this year.

A 45 per cent increase in the number of aircraft shipped resulted in exports valued at over $10 million, says the Aircraft Industries Association Inc., Washington.

Blough Defines Inflation

U. S. Steel's chairman says natural pressures, not controls, can halt cost spiral. Kefauver presses attack, hints revision of Clayton Act to stop "price fixing"

ROGER BLOUGH, chairman, U. S. Steel Corp., offered the Antitrust & Monopoly Subcommittee some personal thoughts on inflation last week.

Answering repeated requests by subcommittee members that he "tell Congress what it should do," Mr. Blough suggested that lawmakers: 1. Understand what inflation is (cost inflation, not shortage-of-goods inflation). 2. Recognize that increased production and productivity per worker will increase everyone's standard of living. 3. Realize that more production depends on more capital investment.

Warning that wage and price controls would accomplish nothing, he noted: "Natural pressures are beginning to make themselves felt in many segments of the economy and will be more and more noticeable as a factor in slowing down general inflation." Supply is catching up with demand in more industries, and our present money policies "may have a constantly growing effect." Any measure Congress recommends must meet this test: "If it will increase savings, it is almost sure to increase production and productivity . . . It is bound to decrease inflationary tendencies and . . . improve the standard of living."

Testimony by John Blair, subcommittee economist, indicated Senator Kefauver will move for revision of the Clayton Act to provide stronger enforcement of prohibitions against price fixing. At present, "conspiracy" has to be "proved." A subcommittee counsel called this the great weakness of the act. How violation of the act could be proved without proving "conspiracy" was not explained.

Union Slant—Otis Brubaker, research director for the United Steelworkers, came into the hearings after Mr. Blough with his own version of the steel industry's problems. Senator Kefauver listened sympathetically as Mr. Brubaker charged:

1. The industry could have cut prices $6 a ton last July and have still "earned greater net profits after taxes in 1957 than were ever earned in history."

2. The industry ignores the "5 per cent increase" in steelworker productivity in 1957 when it raises prices.

Labor Costs Send Castings Up

Despite the government's hue and cry, inflation is continuing to creep along in the metalworking industry. Generally, it is tied to wage increases.

Castings (steel, gray iron, and malleable), started inching up in July following the steel increase (STEEL, July 8, p. 53). By fall, look for a 5 to 7 per cent increase across the board.

"It is the same picture you find in big steel," reports one steel castings producer. "We are paying extra for labor and many materials. There will be a general increase of about 6 per cent by mid-September."

Midwest malleable casting prices have been moving up an average of 6 to 7 per cent since July 1.

Gray iron castings have already started up as foundry labor contracts expire and new ones are negotiated. The average appears to be 5 per cent across the board. Consumers are accepting the increases calmly.

Labor accounts for about half the costs in gray iron foundries, which explains the impact of new contracts. There is no timing period since gray iron shops negotiate around the year. Bulk of these raises are expected in the next three months.

Materials the foundries buy — particularly pig iron—are also going up. One operator says: "This current wave of hikes is being implemented by producers with the greatest reluctance."

How To Win Friends and Influence Bankers

(a) Discuss these factors frankly:

1. **Your market, present and potential.**
2. **Your inventory situation.**
3. **Your accounting practices, including depreciation schedules and reserve policy.**
4. **Earning trends.**
5. **Your personal finances.**
6. **The effect of a major disaster (war, recession, flood) on your business.**
7. **Your labor problems.**

(b) Be specific about:

1. **How much you want.**
2. **What you'll do with it.**
3. **When you'll pay it back.**

(c) Introduce your banker to:

Your sales and production managers, and treasurer.

(Show him the plant, if he has time, and take him home to dinner.)

(d) Be confident (banks borrow money, too).

How To Get a Small Loan

AT 6 PER CENT, a small businessman can get about all the money he needs. The hitch: Who defines his needs?

Your Banker Is Boss—Let's face it, your commercial banker is taking a bigger risk than you are when he lends money for doubtful purposes. You must prove your needs. If you do, chances are you're on the right path.

Any banker's major complaint: Small businesses tend to simplify their problems; look to money as a cure-all. To qualify for a loan, you have to know the true source of your problem.

To do that job: 1. Hire qualified accountants. 2. Keep up with your industry's trends. 3. Count on good advice from your production and sales managers. (If you don't get it, get new managers.)

The most important rule to follow (and the hardest for a small businessman): Forget about running a one-man show.

He Has Many Loans—The most important types of loans for small companies: Term, accounts receivable financing, installment loans on equipment, and warehouse loans. A firm with established credit and the ability to pay can obtain the last three without difficulty because there is ample security inherent in them.

You are most likely to be turned down for a term loan.

Term loans are not usually granted for less than a year, and many run up to five years. They may be used for: 1. Financing expansion and modernization. 2. Consolidating debts.

He Wants To Know—The Federal Reserve Board says less than 50 per cent of term loans require collateral. Your bank, in deciding if it wants collateral, will consider your credit rating, the purpose of the loan, and the amount of your indebtedness. Being a regular customer helps.

The bank will seriously want to know if your loan can meet two tests, whether it's secured or not: 1. Does the loan boost your earning capacity? 2. Will repayment in installments affect your normal earning pattern?

When you first discuss your loan, be prepared to thoroughly analyze what your normal earning capacity is. It doesn't necessarily follow that you won't get the loan if earnings will drop in the first year or so of the loan; maybe earnings will more than make up for the drop in future years. For example, your markets may be undergoing significant shifts that affect your earnings.

Another possibility: Without the money, your company's earnings may drop.

Other Sources — Life insurance companies follow commercial banking practices in granting term loans to small firms. Treat them as you would your banker. One major difference: Banks will usually let you prepay the loan without penalty; insurance companies will take a premium first. Some savings banks, the Federal Reserve banks, and finance companies are other possibilities.

SBA—More companies than ever before are turning to the federal government for help. Small Business Administration officials think it's because money is tight; the American Bankers Association charges that SBA's loans contain

higher margins of risk than bank loans and that many shouldn't be granted.

Over 10 per cent of the loans approved by SBA since it was established in 1953 involved no disbursement of funds. The principal reason, says Wendell Barnes, administrator: "The applicants had made other arrangements, or, because of changed circumstances, the loans were not needed." The lesson in that for you: Use the SBA only as a last resort. You're wiser to establish and maintain good local credit.

Its Requirements — In metalworking, you may have as few as 251 employees and not be a small business, according to SBA regulations; or you may qualify with as many as 1000 employees (the old 500-employee rule went out last December). Whether or not you are dominant in your field affects your standing.

SBA loans money directly or in participation with private lenders. Loans will not be granted: 1. If they're available elsewhere. 2. If the money is needed to pay off other creditors complaining of inadequate security for their loans. 3. If the loan would "encourage monopoly."

The most you can get from SBA is $250,000.

The Outlook—Next year, small business enthusiasts in Congress will make SBA a permanent agency, boost the maximum loan limit, and probably try to lower the maximum interest rate allowed (it's now 6 per cent), if interest rates among private lenders continue to climb.

Generally, Federal Reserve officials and bankers remain confident of small business' ability to finance its expansion in the next decade; legislators on Capitol Hill feel otherwise. Rep. Abraham Multer (D., N.Y.), chairman of the House subcommittee which conducted hearings on SBA this spring, expressed the philosophy of many: "We are at the crucial point in our economic life where small business either expands to meet the increased demands of our markets or remains stagnant."

• *An extra copy of this article is available until supply is exhausted. Write Editorial Service, STEEL, Penton Bldg., Cleveland 13, O.*

Expansion Finished

National Carbon Co. winds up seven-year expansion program to up capacity at six plants

NATIONAL CARBON CO., division of Union Carbide Corp., completed a 50 million, seven year expansion program raising its annual capacity by about 100,000 tons.

"We now have sufficient capacity to take care of anticipated requirements for several years, barring a national emergency," states National Carbon's president, Adger S. Johnson. This was the firm's second major expansion since World War II.

New baking furnaces and equipment rearrangement at the Columbia, Tenn., plant provide flexibility to adjust production of carbon and graphite products as the ratio of demand changes.

Electrode plants at Columbia are equipped to produce carbon and graphite forms for the expanding specialty business, including graphite for nuclear reactors and reference forms for aircraft assembly brazing.

New facilities have been added to plants in Cleveland, Niagara Falls, N. Y., Clarksburg, W. Va., and Fostoria, Ohio. A new plant at Lawrenceburg, Tenn., will use a new forming and baking process to make carbon products.

The big switch to electric furnaces by steelmakers causes optimism about the growth potential of the firm's graphite electrodes.

Chicago Tells Growth Costs

Cost of industrial development announced for metropolitan Chicago in July totaled $21,543,000, bringing the sum for 1957's first seven months to $120,577,000. Comparable figures for 1956 were $14,904,000 and $396,718,000 (including a $230 million steel expansion).

Earnings Top $2 Billion

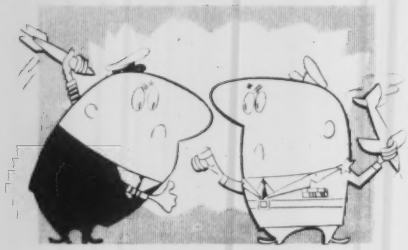
An average pay rate of $2.84 an hour resulted in a payroll of over $2 billion for the steel industry in the first half of 1957, a record.

Wage earners worked an average of 38.6 hours a week compared to 39.9 hours a week for the first half of 1956 when their earnings totaled nearly $63 million less.

For June, 1957, the American Iron & Steel Institute reports an estimated total payroll of $324,823,000, employment of 666,400, and an hourly rate of $2.86.

The hourly rate is at a high for the industry and does not include employment costs of about 29 cents an hour for pensions, social security, and insurance.

Gas-fired baking ovens at Columbia, Tenn., plant produce electrodes for steel furnaces



New Fight Builds Up Steam in Pentagon

A MOVE to create a separate missile service is getting the close attention of high Pentagon brass. Missiles now cross service lines, according to Defense Secretary Charles Wilson's 1956 order which is based on mileage. Example: The Army is limited to a 200-mile missile.

Economy is the most obvious explanation for one service; interdepartmental rivalries like the Thor-Jupiter controversy probably cost taxpayers millions. Mr. Wilson's term as secretary has been highly productive of new rivalries, and he has spent much time defending his decentralized setup. He likens it to the General Motors Corp. arrangement; he says competition among divisions breeds a better product.

The generals and admirals are holding their breath until they see where Neil McElroy, the new secretary, stands on that issue. Cleaning up his desk before Mr. McElroy comes in, Mr. Wilson says a decision on the Thor and Jupiter will be made before Oct. 1.

Missile Shakeout To Be Announced

A decision on the Air Force intercontinental ballistic missiles—the Atlas and the Titan—also must be made. The Atlas is the more highly developed of the two.

Critics think there are two basic reasons for needless duplication: 1. Rivalries. 2. The desire to keep suppliers happy by making more work—as the AF did by giving General Dynamics Corp.'s Convair Div. the development contracts for the Atlas' airframe and Martin Co. a similar contract for the Titan.

Proponents of the competitive theory say it's necessary to fire the missiles to know what they can do.

How Long for Manned Aircraft?

Mr. Wilson contends we will rely mainly on aircraft (as opposed to missiles) for defense in the next three —perhaps ten—years. But it seems inevitable to certain Pentagon observers that a separate missile service is in the cards: How long should we wait to establish it?

The AF is torn between two elements:

1. Its manned aircraft people, including top brass of Strategic Air Command, want the AF to concentrate on heavy bombers as long as it's tactically possible.

2. Its missile people don't want the AF to miss the chance to be the "missile service" or the "defense service of the future."

The Army and Navy continue to fight for their roles, but within those departments are dedicated men who believe our present decentralization is extremely dangerous.

Showdown in 1958—Maybe

Look for the House Defense Appropriations Subcommittee to try to force Mr. McElroy into establishing a separate missile service, either actually or by giving the AF prime responsibility.

Word has come down from the White House that $38 billion annually is tops for defense expenditures through fiscal 1961. The subcommittee, sincerely disturbed by duplicated missile programs, won't let Mr. McElroy off as easily as it did Mr. Wilson.

Summing Up: When the single agency concept comes into being, every program supplier will be affected. Chances are that this will make the present aircraft shakeout look like peanuts. For efficiency's sake, the weapons system concept could be extended to include the biggest package possible, rather than the subsystem technique used today. That would mean more subcontracting by the prime contractor and fewer prime contractors.

Solar Energy Push Will Come

"If a man can harness solar energy, he may not only solve the world's growing power problem but also pave the way for peace and plenty for centuries ahead." Thus Rep. Craig Hosmer (D., Cal.) phrases the nation's biggest long range problem.

Because, he implies, we don't have time for power (public or private) politics to force a decision on solar energy, we must begin now, in a bipartisan way, with a $10 million, ten year research program.

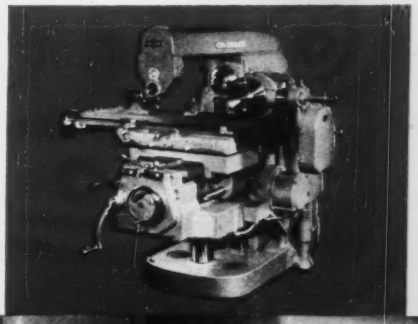
Rep. Hosmer thinks research is proceeding at "a snail's pace" and should get government aid immediately. Only about $500,000 a year is being spent on solar energy research by Bell Telephone Laboratories, Hoffman Electronics Corp., and E. I. du Pont de Nemours & Co. Look for Congress to go along with Rep. Hosmer's program next year.

Will Money Loosen Up?

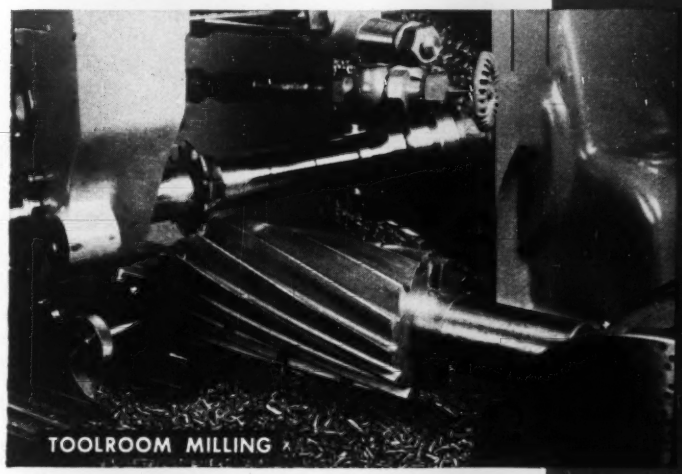
William McC. Martin Jr., chairman, Federal Reserve Board, has told the Senate Finance Committee that money may loosen up before it gets any tighter. The FRB is confident that the cut in Defense Department spending will fan out enough in 1958 to give the country a breather from the boom.

DIAL TYPES for Toolroom Milling

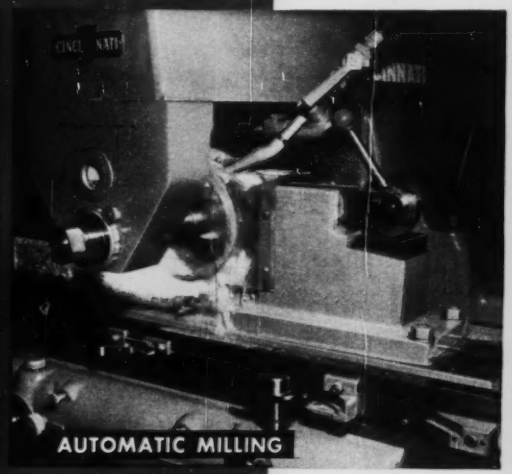
For uniformly low manufacturing quantities, Dial Types with conventional table cycles will be your first choice. They are available in Nos. 2, 3 and 4 sizes; plain, universal and vertical styles; standard (2½" to 100") or short lead (.010" to 1000") range for the universal machines.



CINCINNATI No. 2 Universal Dial Type Milling Machine



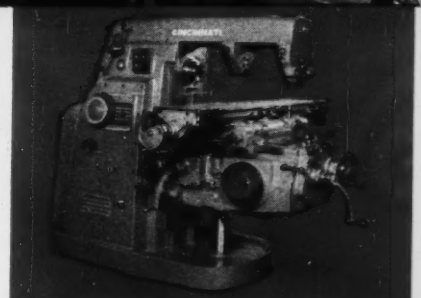
TOOLROOM MILLING



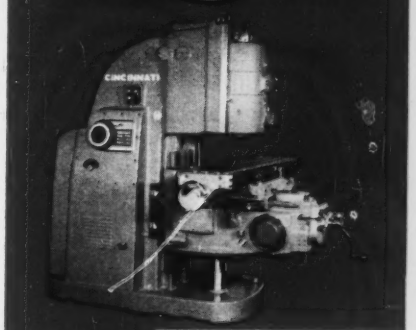
AUTOMATIC MILLING

DIAL TYPES for Automatic Milling

For widely varying manufacturing quantities, Dial Types with automatic table cycles are ace high in keeping costs down. By merely setting the dogs at the front of the table, any feed and rapid traverse combination of the three basic cycles is obtainable: feed right; feed left; alternately left and right, continuously or with center safety stop. Standard features of versatility are retained in these machines. Available in Nos. 2, 3 and 4 sizes; plain and vertical styles.



CINCINNATI No. 2 Plain Dial Type Milling Machine



CINCINNATI No. 3 Vertical Dial Type Milling Machine

Compare CINCINNATI® Dial Type Milling Machines with any other in the 10 to 20 hp classification. In no other machine will you find advantages such as:

Dynapoise overarm . . . push-button spindle speed selection . . . automatic backlash eliminator.

A complete list of Dial Type advantages and specifications is contained in catalog No. M-1915-2. May we send a copy to you?

THE CINCINNATI MILLING MACHINE CO.
CINCINNATI 9, OHIO

DIAL TYPE LINE		table traverse	main drive	automatic table cycles available
No. 2	Plain	28"	10 hp	yes
	Universal			no
	Vertical			yes
No. 3	Plain	34"	15 hp	yes
	Universal			no
	Vertical			yes
No. 4	Plain	42"	20 hp	yes
	Universal			no
	Vertical			yes

CINCINNATI

MILLING MACHINES • CUTTER SHARPENING MACHINES • BROACHING MACHINES • METAL FORMING MACHINES • HARDENING MACHINES • OPTICAL PROJECTION PROFILE GRINDERS • CUTTING FLUID

How to put your finger on a good plant location specialist . . .

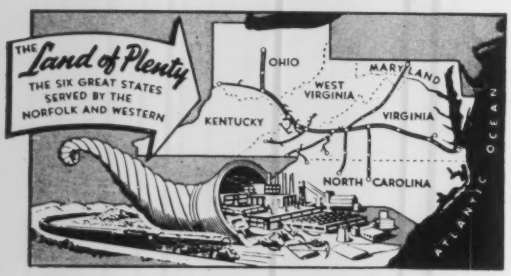
Since nobody builds plants out of petty cash or puts the roof on overnight, you want a man who knows as much about plant location as your doctor knows about medicine or your attorney about law.

You want a man who has the facilities of a plant location team with many years of sound experience . . . a team with an outstanding record for *showing the way* to other manufacturers . . . a team which, individually and collectively, knows its business.

You want a man you "don't have to draw a picture for . . . who will *grasp* your problem, know what you want, why you want it, and where to find it."

You want a man who knows his territory like you know your front yard. You want a man who is not the high-pressure type, who goes about your business quietly and in confidence, who is enthusiastic but respects only facts . . . a man who will work for you without obligation.

Where can you put your finger on this man and his team? It's simple.

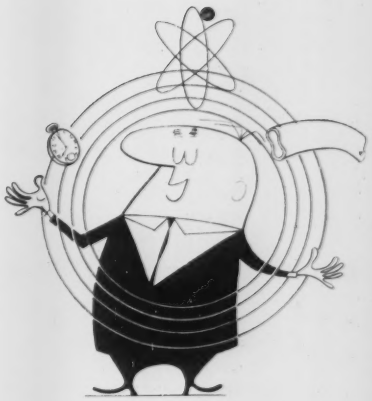


Write, wire or phone —
L. E. Ward, Jr., Manager
Industrial and Agricultural Department
Drawer S-753 (Phone 4-1451, Ext. 474)
Norfolk and Western Railway
Roanoke, Virginia

Norfolk and Western RAILWAY

To produce for jewelry and AEC looks like jugglery; yet it's . . .

Diversification at Makepeace



ADDITION of atomic energy products at D. E. Makepeace Co., a unit of Engelhard Industries, Attleboro, Mass., is requiring a minimum of change in technology and organization.

The company will continue to make rolled gold or gold filled plates for watch cases, optical frames, and jewelry. Diversified production includes atomic fuel fillers, clad fuel elements, and related reactor components.

Expansion — Improvements include three new vacuum melting furnaces, equipment for rolling and contour forming, and expanded tooling. A newly equipped plant (53,000 sq ft) at Plainville, Mass., and some expansion at Attleboro complete the program.

Gains in efficiency will keep employment at the 700 level.

Similar Techniques — Uranium, zirconium, and titanium require metallurgical and finishing methods that are similar to those used for precious metals.

M. F. Mittendorf, vice president of Attleboro-Plainville operations, states: "Industries far removed from jewelry and silverware are using large quantities of materials and parts requiring specialized melting, drawing, and laminations."

New Products — Among the uranium alloy fuel fillers produced are: Uranium-aluminum, uranium - niobium, uranium - zirconium, and uranium oxide-stainless steel.

Operations include melting, forging, form rolling, vacuum annealing, slitting, cladding, and machining.

Mill facilities are designed to AEC regulations, including a disposal system for waste materials. The AEC will take bulk of early production.

Nuclear applications account for most of the potential zirconium volume. Aircraft and missiles are the major outlet for titanium, although the use by both has been below expectations.

Zirconium and titanium are form rolled, heat treated, and fabricated.

The materials are annealed and heat treated in a vacuum at temperatures up to 2250° F. End products include solid and laminated flat stock; solid, laminated, wave guide, and special tubing; contour rolled stock wire, and solder wire.

5000 Shapes — Dies, rolls, and hobs produce a variety of shapes and patterns in the tubing. Wall thickness and diameter tolerances of 0.005 in. are held in the deep drawn stock.

Tubing diameters are 0.015 to 2 in. in lengths to 20 ft. Solid and laminated wire as fine as 0.005 in. in diameter is produced with a tolerance of 0.0001 in.

Rectangular tubing for wave guides is drawn to tolerances of 0.001 and 0.002 in. Precision wave guide tubing is used in microwave equipment.

The products formed by form rolling require a minimum of machining; in many cases, finishing operations are eliminated.

Cobalt 60 Prices Reduced

Radioactive cobalt 60 prices have been reduced by the Atomic Energy Commission. This move is expected to encourage widespread distribution and use of the radioisotope in industrial, medical, and research applications.

The new prices range from $2 to $5 per curie and are based on the number of curies per gram of material and the quantity purchased.

The AEC is the only producer of cobalt 60 in the U. S. The current annual production is about 300,000 curies. An increase in production is not planned by the commission. It hopes that the increased market will cause industry to undertake production in private reactors.

If the demand for cobalt 60 exceeds the supply available from commission production, preference will be given to medical requirements.

Flight System Orders Soar

Transistorized automatic flight control systems will equip new fleet additions of 17 commercial air lines. Eclipse-Pioneer Division, Bendix Aviation Corp., announced a $1.1 million order from Convair Division, General Dynamics Corp.

The firm now has a $16.5 million backlog for the systems. First deliveries are scheduled for Trans World Airlines.

Mercury Reserves Estimated

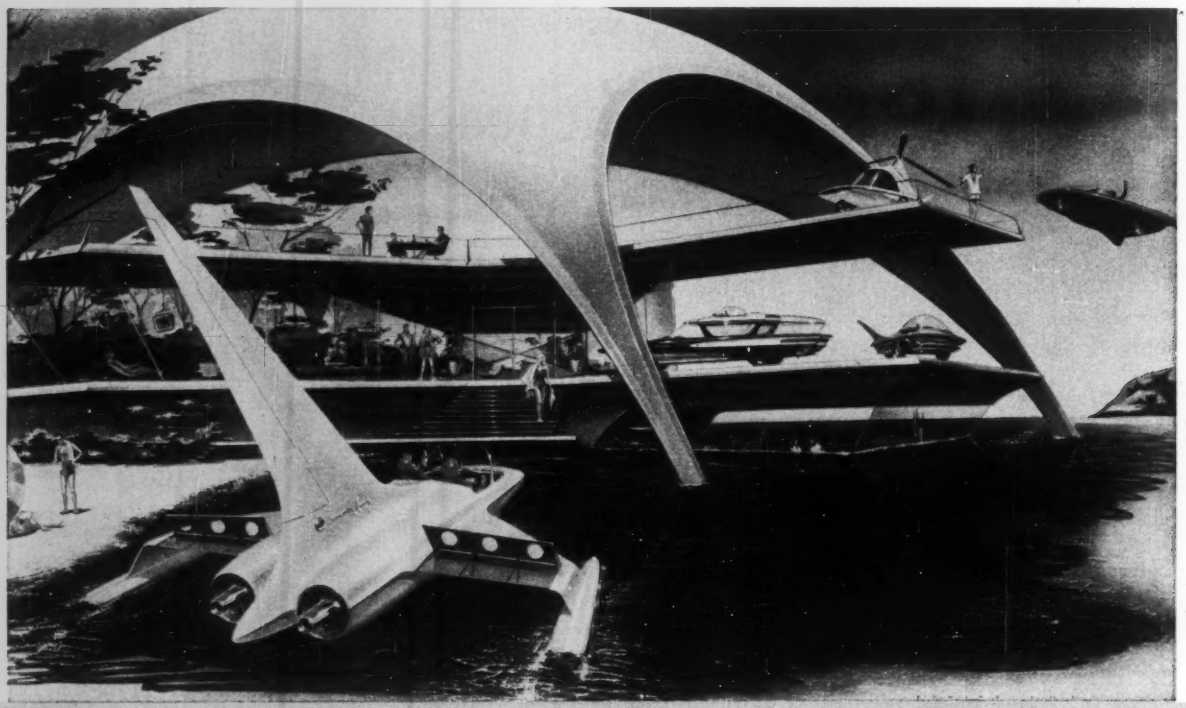
The Department of the Interior estimates that the U. S. has mercury ore reserves of about 315,300 flasks of mineable grade. (A flask equals 76 pounds.) Current domestic production is about 30,000 flasks a year and consumption about 55,000 flasks annually.

The average grade of ore currently being processed in the U. S. is about 8 lb per ton.

Apprentices Increase

Vocational and trade schools have increased their activity this year with 190,000 registered apprentices in training, an increase of 15,000 over a year ago.

W. C. Christensen, director of the Department of Labor's Bureau of Apprenticeship & Training comments: "It is encouraging to note that industry not only is becoming increasingly aware of its training responsibility, but that it is doing something about it."

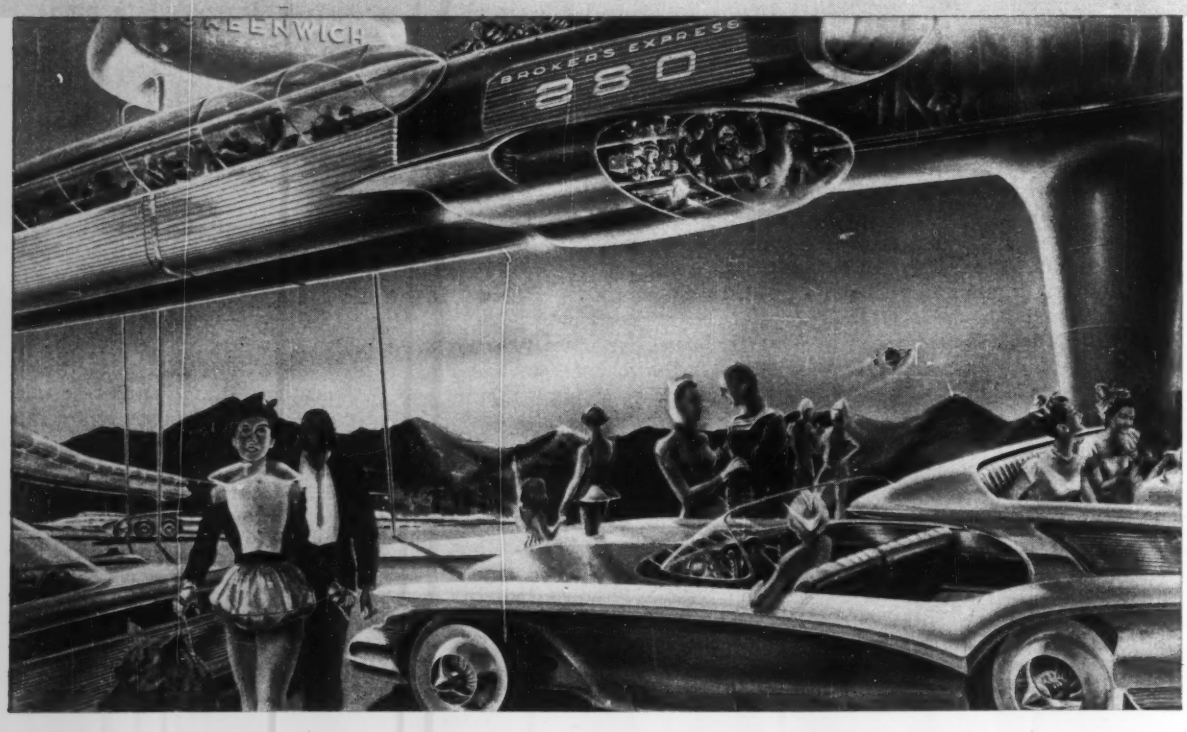


Auto Aquatics

An aquacar (foreground) brings swimmers to beach. "Conventional" cars stand on lower ramp. An autocopter lands on the upper ramp, while a levitating machine wafts into view

Monorail Commuting

Suburbia of the future still finds Mom and the kids waiting for Dad to come home from the office. But commuter trains are monorails. Dress fashions have changed, too



Speed Limit: 120 mph

"I was only going 115," might be the argument of the young lady behind the wheel of this sports car. But the traffic cop says all-points radar has clocked her speed above the 120 mph limit. The 21st century counterpart of the el appears in background

Transportation: 2000 A. D.

IN AN ISOLATED area of the Ford Motor Co. Styling Center, Dearborn, Mich., behind doors to which few have keys, people make a business of letting their imagination run free.

Economists foresee high levels of income, a shorter work week, and a fabulous leisure market.

Scientists foresee interplanetary rocket ships, skies dotted with manmade satellites, and atomic capsule power.

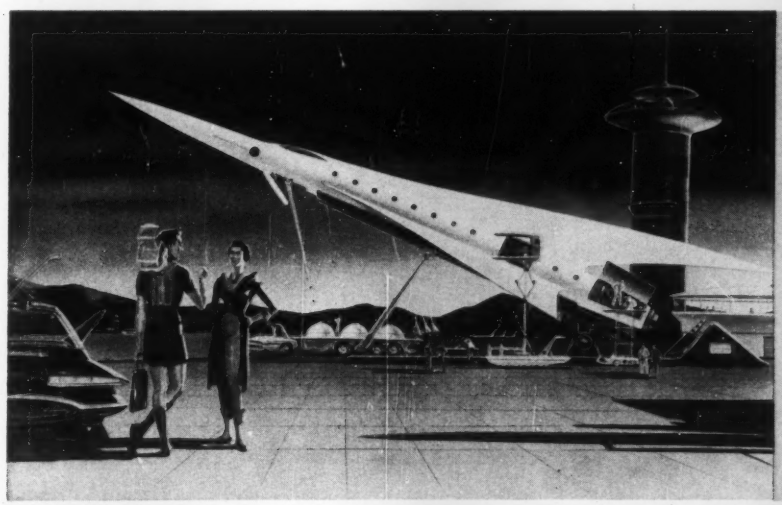
On these pages, Ford's visioneering stylists, led by George W. Walker, vice president and director of styling, depict the transportation methods which may be used by this leisurely and adventurous populace.

Fiction? More probably fact. Perhaps you'll be working with a metal having the hardness of carbide, the tensile strength of tungsten, the corrosion resistance of chromium, the malleability of lead, the ductility of silver, and the machinability of brass.

Even better: The profit squeeze may be nonexistent.

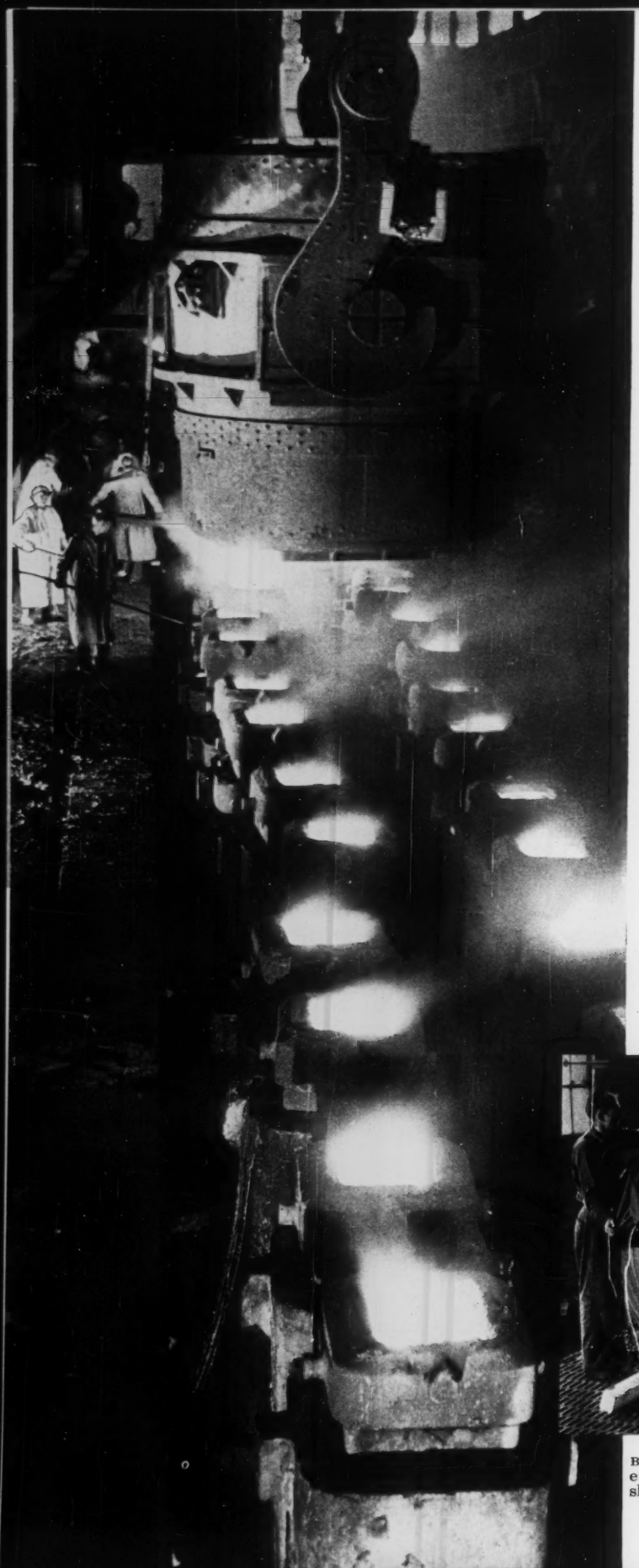
GEORGE W. WALKER

George W. Walker, Ford's top "visioneer," says: "The eye and hand of the stylist are guided by thoughtful research and fanciful dreams"



Space Vacation

En route to the Moon, this traveler stands by his car while the ground crew readies the Lunar Liner for a scheduled flight



How Great Lakes Steel *teems* quality

You're up on the catwalk above the pouring platform along the open-hearth pit at Great Lakes Steel. Right below, one of the giant 250-ton teeming ladles is filling another train of hot-top ingot molds.

At no step in the production of good, deep-drawing steel is control of quality more important than in the teeming operation. For defects can easily develop *unless* the entire pouring operation is done exactly right . . . the way it is at Great Lakes.

For example, these hot-top molds are designed to eliminate shrinkage cavities in the finished product. A special lining compound of graphite or tar blankets the inside of every mold to form a highly protective shield for the delicate ingot surface.

And that's only a sample of the care Great Lakes takes *every step of the way* to maintain high and uniform quality steel!

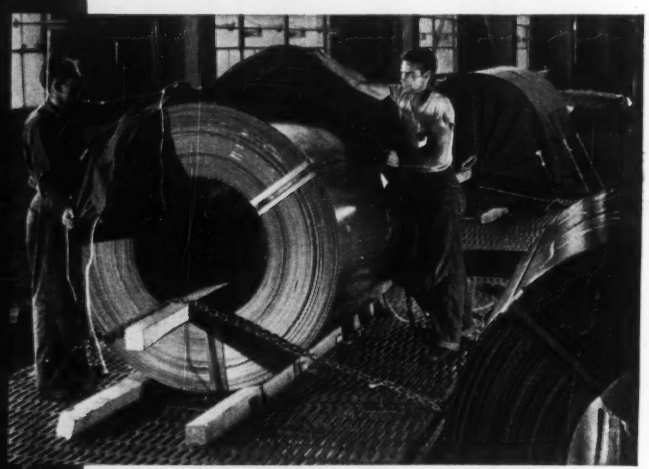
The easiest way to reach us? Simply phone our nearest representative.

GREAT LAKES STEEL CORPORATION

Detroit 29, Michigan • Division of

NATIONAL STEEL CORPORATION

District Sales Offices: Boston, Chicago, Cincinnati, Cleveland, Grand Rapids, Houston, Indianapolis, Lansing, Los Angeles, New York City, Philadelphia, Pittsburgh, Rochester, St. Louis, San Francisco, Toledo, Toronto.



BUILT-IN QUALITY of Great Lakes steel is guarded through every step to final delivery. Here shipments of flat-rolled sheet coils are covered with tarpaulins for protection.

Argonaut: Another New Car

For the first time in 25 years, Cleveland industrialists will manufacture a passenger auto. The powerful roadster may be this generation's answer to the Duesenberg

WHILE most Americans are willing to believe that Henry Ford can bring out a new car this fall, few would bet on the ability of a Cleveland group to perform such a feat.

But within a few weeks, its product, the Argonaut, will make its debut in major U. S. cities. It's a big, expensive roadster—described by the maker as "sufficiently strong to provide unusual protection, last a decade or longer, insure passengers' comfort, possess exceptional road holding qualities, and deliver fabulous performance."

Will It Sell? — Those who are backing the Argonaut—businessmen and industrialists of Cleveland, Detroit, Pittsburgh, and Canton, Ohio — are well aware that they're bucking the trend. Sales of such high priced entries as Continental and Eldorado Brougham have been disappointing, in spite of reports that disposable income is at an all-time high.

To succeed, the Argonaut must be more than an elaborate version of something else, its backers contend. It must have an original design, matchless workmanship, and superior engineering. "It does," claims John S. Parker of Shaker Heights, Ohio, Argonaut Co.'s vice president and sales director.

A Man's Car—The Argonaut is produced in one model only, a convertible roadster with two bucket seats upholstered in Italian leather. The floor of the cockpit is ribbed aluminum, with rubber inserts. The dash is padded, but there are no seat belts.

Argonaut's design, still a secret, is described as "distinguished but rakish." Chrome appears only on the bumpers, which are chromium molybdenum. Whether the body is metal or plastic hasn't been revealed, but the material is said to be unusually durable.

Specifications — All Argonauts have a 127-in. wheel base. Length is about 215 in.; tread, 66 in. (8.20 x 15 racing tires are used); height to cowl, 37 in. (Center of gravity is said to be the lowest in the industry.) The frame is 5-in. cold-drawn steel tubing, with 3/16-in. walls and ¼-in. attachments. Coated with white vinyl paint, it weighs 1060 lb. (One engineer, not employed by Argonaut, calls it three times stronger than any auto frame now in use.) Curb weight of the car: Less than 5000 lb.

The V-8 engine has a displacement of 392 cu in. and is said to be one of the most powerful ever installed in a production automobile. Its driveshaft is stressed for 9000 rpm. There are two transmissions: Manual with overdrive or automatic (at no additional cost). A special radiator and oil cooler are provided. Fuel tank capacity is 32 gallons; fuel consumption is estimated at 15 mpg.

Engineering — Boasting 50-50 weight distribution, the Argonaut doesn't have power steering. It has power brakes, but the power isn't achieved through vacuum assists. The suspension system consists of torsion bars in front and semielliptic springs at the rear. Front and rear shock absorbers are individually adjustable from the cockpit.

The Argonaut is being hand assembled in a leased plant at Cleveland. No passenger car has been manufactured in that city since 1932, when the Peerless expired. Major parts, such as transmission, rear axle and brakes, come from independent suppliers. The frame is made in Cleveland, the engine in Detroit. Some parts, such as the radiator, are fabricated by Argonaut.

The Market—Although the car is suitable for city driving, Mr. Parker says it will be "most in its element" on the open roads of the western states and in the mountain passes of Europe. It's designed for executives and sportsmen who want a car of unusual capability. It will be distributed by American agencies for foreign cars. First year production is expected to run between 600 and 1000—some say Texans alone will buy 300.

The price: More than $10,000.

U. S. Auto Output

Passenger Only

	1957	1956
January	642,089	612,078
February	571,098	555,596
March	578,826	575,260
April	549,239	547,619
May	531,365	471,675
June	500,271	430,373
July	495,629	448,876
7 Mo. Total	3,868,517	3,641,477
August		402,575
September		190,726
October		389,061
November		581,803
December		597,226
Total		5,802,808

Week Ended	1957	1956
July 20	124,894	113,416
July 27	119,857	111,247
Aug. 3	119,323	111,157
Aug. 10	118,864	108,167
Aug. 17	117,494†	98,348
Aug. 24	116,500*	69,977

Source: *Ward's Automotive Reports.* †Preliminary. *Estimated by STEEL.

Auto Exports Decline

During the first half, the U. S. exported only 88,214 new cars, a decline of 29 per cent from the 123,613 of the year-ago period, reports Automobile Manufacturers Association.

Excluding Canada, where unusual conditions obtained, the decline was not so great, but exports still fell to 77,787, or 16 per cent lower than the 92,247 of last year. In the first half of 1956, GM was shipping cars into Canada at a heavy rate to compensate for production losses at strikebound Canadian plants. This year, uncertainty as to whether the new government will reduce or remove the 10 per cent excise tax on cars results in a slightly depressed market.

The great weakness in sales of

American cars this year has been in Europe and the British Commonwealth countries. The Suez crisis was a factor, particularly in the commonwealth.

As a result, wholesale deliveries of U. S. cars in Europe (including some North African areas) during the first five months of this year were only 15,400, down nearly 26 per cent from the 20,800 of the like period last year. Throughout the commonwealth, excluding Canada, sales during the same period fell to 13,200 from 23,000 in the first five months of 1956.

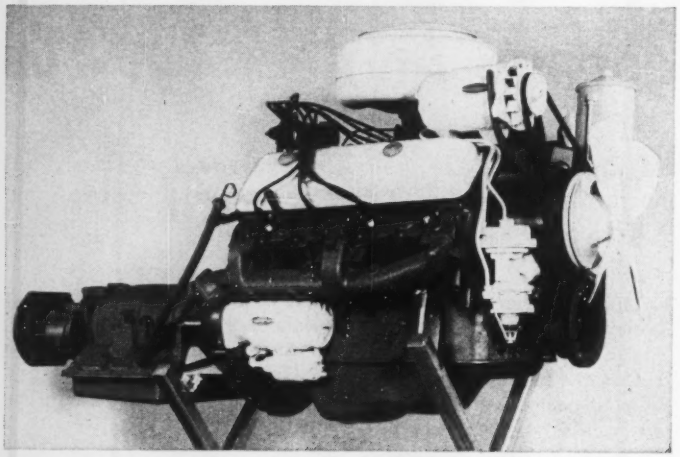
Growth of the European auto industry is best represented by West Germany, which last year became the largest European manufacturer and exporter, surpassing the United Kingdom for the first time. In 1956, West Germany turned out 1,075,619 vehicles, up 18.4 per cent from the 908,742 of 1955. Of this number, 45.4 per cent or 488,331 were exported. That compares with exports of 398,385 vehicles by the U. S. During the first four months of this year, German firms boosted their sales in the Union of South Africa from 6100 to 8805, while sales of American makes fell from 7200 to 5400.

On the brighter side, AMA reports that overseas demand for this country's trucks and buses is nearly as good as in any year since World War II. Exports of trucks during the first half of this year were 111,772, an increase of 3 per cent over the 108,762 shipped in the comparable period last year. Bus shipments rose to 356 from 145.

Exhaust Notes

• The Edsel Citation contains about 51 lb of aluminum, reports W. S. McChesney, Alcoa's manager of industry sales. Average aluminum content of 1957 cars is 38 lb.

• American Motors Corp. will rustproof its 1958 bodies by submerging them in a tank containing ferrochrome, a red oxide fortified with zinc chromate. All sheet metal, including the insides of doors, pillars, sills, and other areas inaccessible to spray coating will be protected from rust by the primer, claims E. W. Bernitt, vice president of automotive operations.



Two AMC Cars Use Same Block

• RAMBLER'S V-8, shown above, doesn't look revolutionary—and it probably isn't.

What's unusual is that it shares the same block with the Hudson Hornet and Nash Ambassador, its big brothers in the stable of American Motors Corp.

Big Savings—By moving to a standard block, AMC simplified engine production and may save as much as $12 million in tooling costs. Such gains aren't unappreciated in Detroit, so the probability is strong that other automakers will follow suit. Chrysler is expected to put the same engine in 1958 Dodges and De Sotos. And Ford will continue its research.

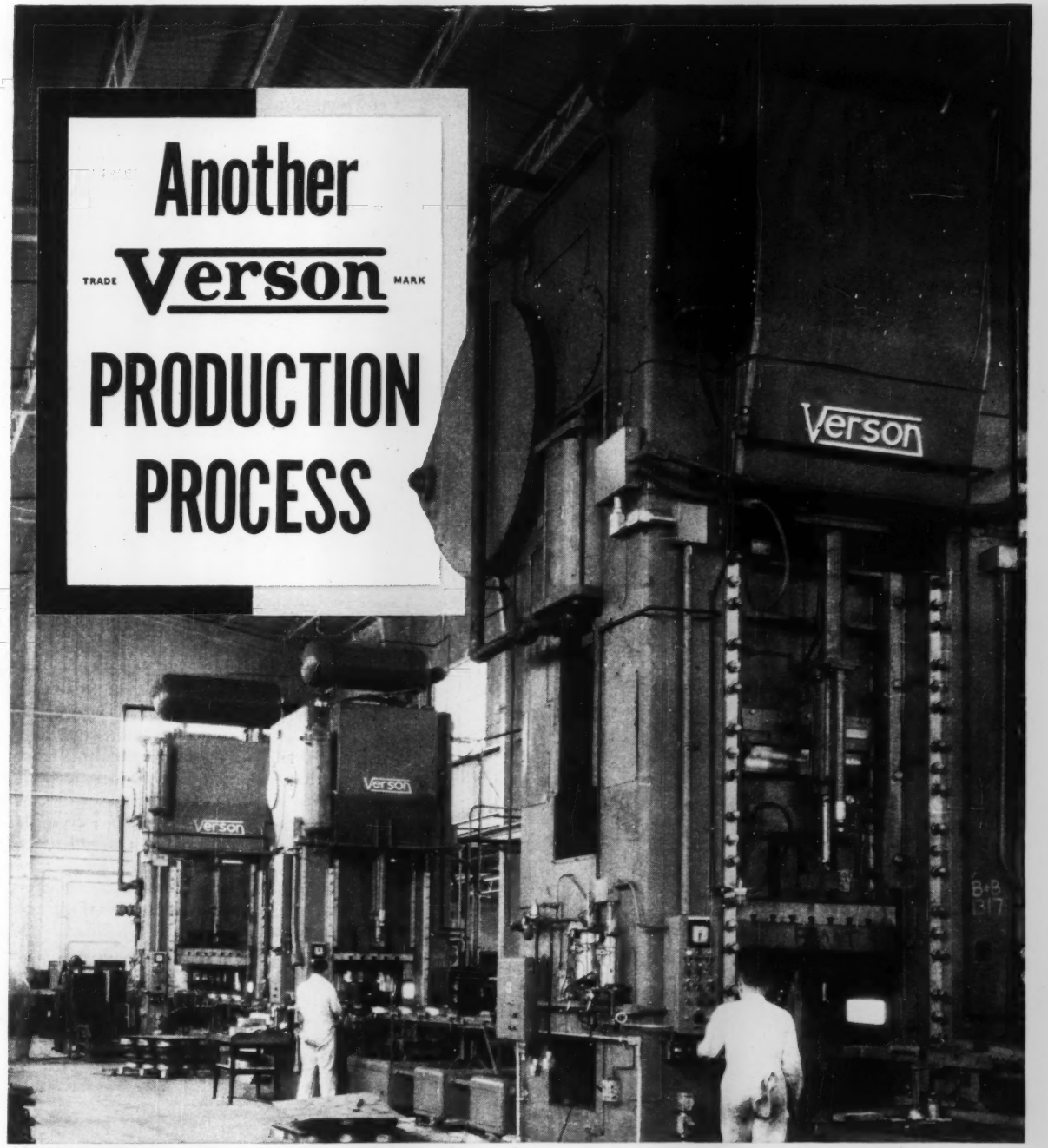
When AMC brought out the V-8 last year, designers spoke enthusiastically of its "flexibility." The engine could be readily adapted to future displacement requirements and compression ratios, they said. What's more, it could be easily installed in future bodies. It was low (23 in.), narrow (25⅝-in.), short (27 in. plus), and light (601 lb, without transmission).

One version of the V-8 was installed in last year's Nash Statesman. Although the Statesman was dropped this year, its engine survives as the power plant for Rambler, bellwether of the corporation. With a 3½-in. bore and a 3¼-in. stroke, it has a displacement of 250 cu in. and develops 190 hp.

Few Changes Needed—Adapting Rambler's V-8 for use in larger cars required minimum changes in the block: Pattern and machining revisions for bore size. Only bob weights on crankshaft balancing equipment needed changing.

Installed this year in the Hudson Hornet and Nash Ambassador, AMC's "big" V-8 has a 4-in. bore, a 3¼-in. stroke, and a 327 cu-in. displacement. At 4700 rpm, it develops 255 hp. Outside dimensions are the same as for Rambler's engine.

Limitations—Whether the Big Three can follow AMC's lead is none too clear because a block's displacement can be varied by little more than 30 per cent. It's one thing to make one block serve two cars (three names, actually, but Hornet and Ambassador are almost identical). It is quite another to make two blocks serve five.



Engineered and Developed by Verson to Make Manufacturing More Profitable

Here is a good example of what Verson engineering can do in automated press lines . . . and this is no theoretical concept . . . it is a tried and proven production process which has been in operation for one year.

Three Verson Eccentric Presses (1500, 200 and 600 tons respectively from front to rear in above photograph) are synchronized with automatic transfer and feeding equipment. The part produced is an automotive transmission drive housing.

As a manufacturer of both Transmat and automated press line processes and related tooling, Verson is well qualified to assist you in high production automatic stamping problems. For specific recommendations send an outline of your requirements. 163

VERSON ALLSTEEL PRESS CO. •

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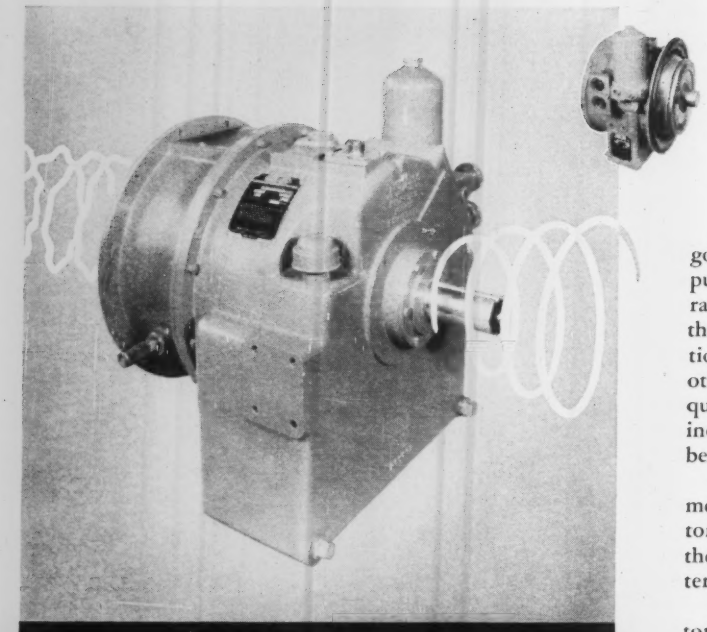
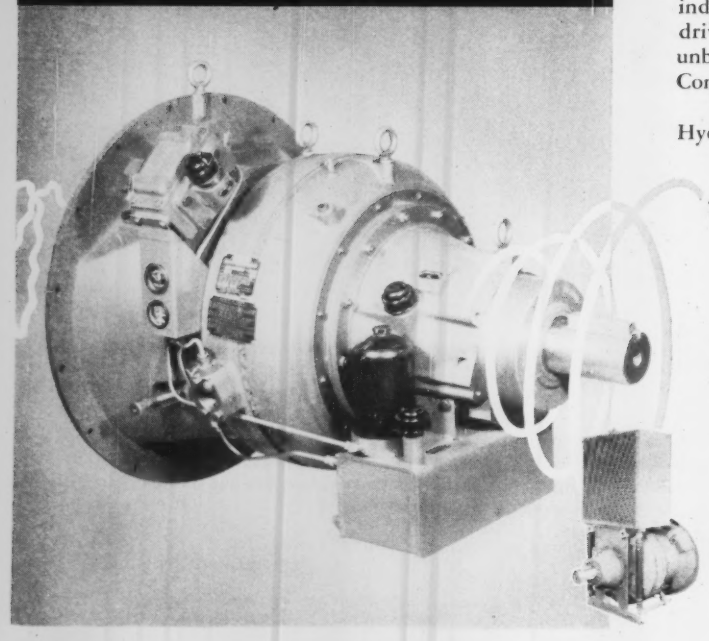
8300 S. Central Expressway • Dallas, Texas



Single-Stage Torque Converters or Three-Stage Torque Converters?



The answer to the question of "single-stage vs. three-stage" depends largely on the characteristics of the equipment you manufacture or use and the jobs it is required to do. Naturally, many factors must be known before any engineering department can be expected to make recommendations.

Generally speaking, however, when it is desired to have minimum pulldown from governed engine speed—with maximum power output over a wide range—and to produce high torque ratios for hoisting or heavily loaded vehicles, a three-stage torque converter, with torque multiplication up to six times, may be most desirable. On the other hand, where mild torque conversion is required, as in certain types of vehicles and in other industrial equipment—a single-stage converter may be the best choice.

Now you can benefit from the unbiased recommendations of one manufacturer in choosing a torque converter—single-stage or three-stage—with the exact capacity and torque transmission characteristics to give your equipment maximum efficiency.

Twin Disc Clutch Company's line of single-stage torque converters—available as the 1300 and 1500 Series units—complements its time-tested, universally accepted line of five series of three-stage units. Single-stage *or* three-stage—from 30 to 1000 hp—you can depend on Twin Disc Torque Converters to give your equipment better performance . . . less downtime . . . and greater earning potential.

In addition to offering the most complete, the most versatile line of industrial torque converters available, Twin Disc manufactures fluid couplings in a wide range of sizes for engines and motors from ¾ to 850 hp, and friction clutches for applications from fractional to 1050 hp.

For smooth, dependable transmission of power to your equipment and machinery, standardize on Twin Disc—the world's leading manufacturer of industrial fluid and friction drives. Whatever your drive problem, you can count on Twin Disc for unbiased recommendations . . . for Twin Disc Clutch Company makes them all.

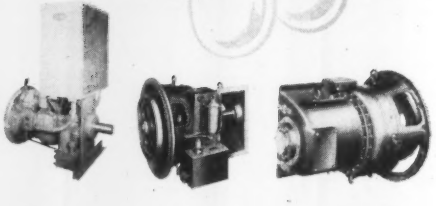
Twin Disc Clutch Company, Racine, Wisconsin; Hydraulic Division, Rockford, Illinois.

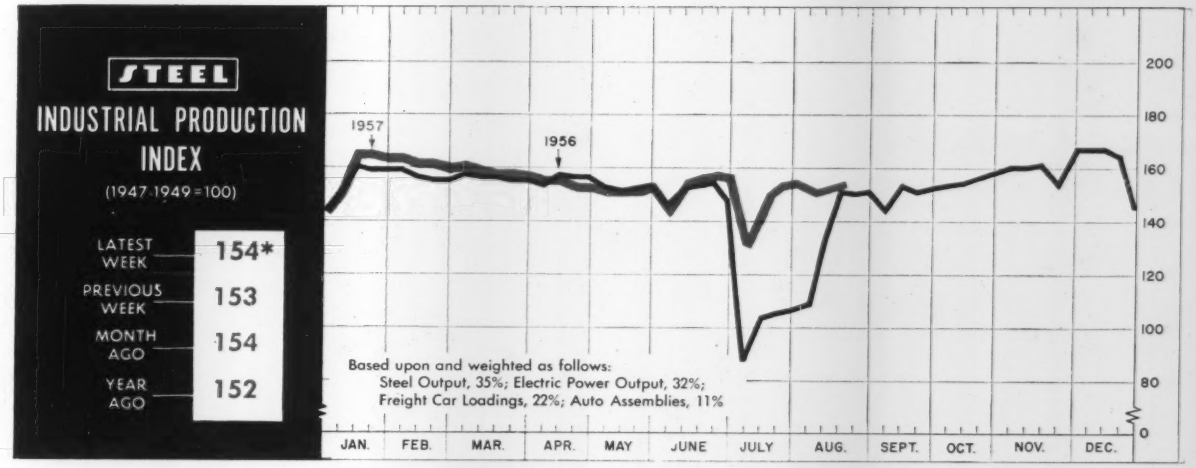
TWIN DISC MAKES THEM ALL

TWIN DISC
CLUTCHES AND HYDRAULIC DRIVES

TWIN DISC

Torque Converters





*Week ended Aug. 17.

Chances Good for Upturn in September

SEPTEMBER likely will be the pivot point of 1957 for metalworking. The sidewise movement has just about run its course. Chances are good the trend line will go up late in the month after taking time out for Labor Day.

Two Choices—So far this year, business has had three available courses—up, down, and sidewise. Soon, it will have only the first two. A level course would represent a deterioration of business conditions because the fourth quarter historically is the strongest period of the year. In three of the last four years, the uptrend that started in September carried through to the end of the year. Only in 1953, when September failed to recover the pre-Labor Day level, did the trend continue down.

Odds Favor "Up"—Several segments of metalworking which have been "off" this year are showing signs of breaking upward. Appliance makers believe they have seen the worst of their problems. The inventory pipeline is running dry, and new models are stimulating sales efforts. What's more, officials are backing up their confidence with significant orders for September steel. The auto industry is having one of its biggest Augusts in history from a production viewpoint. September will be slow, but industry executives are planning a strong introduction period for 1958 models. *Ward's Automotive Reports* says fourth quarter plans call for 1,559,200 units, 1.4 per cent better than originally scheduled two months ago.

The developments in appliances and autos are creating optimism in the steel industry. Production has been inching up for seven consecutive weeks. The full impact of the model changeover in Detroit will not be felt until production builds up steam in October. By then, the operating rate of the nation's steel mills should be in the 90 per cent plus range.

The auto and appliance industries

BAROMETERS OF BUSINESS

	LATEST PERIOD*	PRIOR WEEK	YEAR AGO
INDUSTRY			
Steel Ingot Production (1000 net tons)[2]	2,123[1]	2,062	2,359
Electric Power Distributed (million kw-hr)	12,100[1]	12,070	11,794
Bituminous Coal Output (1000 tons)	9,685[1]	9,700	9,386
Petroleum Production (daily avg—1000 bbl)	6,800[1]	6,797	7,086
Construction Volume (*ENR*—millions)	$411.9	$298.3	$258.1
Auto, Truck Output, U. S., Canada (*Ward's*)	146,425[1]	137,143	126,675
TRADE			
Freight Car Loadings (1000 cars)	740[1]	740	770
Business Failures (Dun & Bradstreet)	265	281	229
Currency in Circulation (millions)[3]	$31,069	$30,983	$30,681
Dept. Store Sales (changes from year ago)[3]	+3%	0%	+7%
FINANCE			
Bank Clearings (Dun & Bradstreet, millions)	$19,238	$21,102	$19,788
Federal Gross Debt (billions)	$271.7	$271.9	$272.4
Bond Volume, NYSE (millions)	$17.7	$16.3	$17.1
Stocks Sales, NYSE (thousands of shares)	8,800	9,422	9,030
Loans and Investments (billions)[4]	$86.0	$86.4	$84.4
U. S. Govt. Obligations Held (billions)[4]	$24.8	$25.2	$25.8
PRICES			
STEEL's Finished Steel Price Index[5]	239.15	239.15	225.71
STEEL's Nonferrous Metal Price Index[6]	214.3	214.3	261.8
All Commodities[7]	118.0	118.1	114.5
Commodities Other Than Farm & Foods[7]	125.6	125.6	122.2

*Dates on request. [1]Preliminary. [2]Weekly capacities, net tons: 1957, 2,559,490; 1956, 2,461,893. [3]Federal Reserve Board. [4]Member banks, Federal Reserve System. [5]1935-1939=100. [6]1936-1939=100. [7]Bureau of Labor Statistics Index, 1947-1949=100.

Coming

Sept. 2

IN

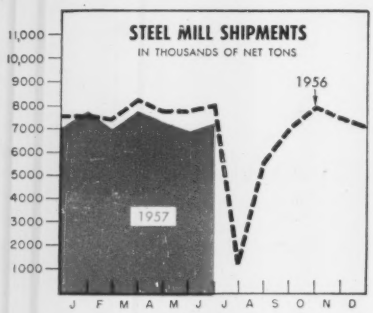
STEEL

Spinning Keeps Pace with New Technology

Spinning is one of the oldest and simplest methods of metal forming—and it's still one of the best for many parts applications.

New developments, notably automatic spinning, have increased the use potential of this production technique. Next week, STEEL will show how some manufacturers have improved product design and lowered costs by specifying spun parts.

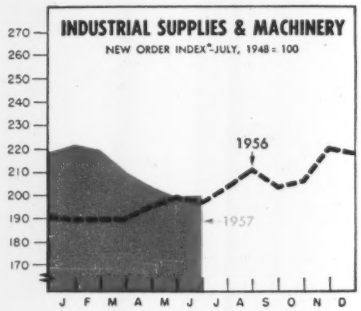
THE BUSINESS TREND



Net Tons

	1957	1956	1955
Jan.	7,809,451	7,587,870	6,009,958
Feb.	7,066,732	7,468,393	6,119,900
Mar.	7,821,616	8,255,824	7,268,795
Apr.	7,349,752	7,783,873	7,279,321
May	6,972,091	7,764,776	7,540,889
June	7,284,616	8,077,805	7,770,213
July	1,288,988	6,250,597
Aug.	5,539,915	7,053,615
Sept.	7,058,028	7,378,247
Oct.	7,930,957	7,216,821
Nov.	7,431,136	7,247,994
Dec.	7,064,093	7,580,943

American Iron & Steel Institute.
Charts copyright, 1957, STEEL.



	1957	1956	1955
Jan.	221	190	160
Feb.	219	190	166
Mar.	210	190	171
Apr.	203	195	172
May	199	199	177
June	199	197	189
July	...	203	182
Aug.	...	211	186
Sept.	...	203	196
Oct.	...	206	195
Nov.	...	220	194
Dec.	...	218	191

*Seasonally adjusted.
Amer. Supply & Machinery Mfrs'. Assn.

will stimulate production of many allied industries, such as stampings and castings, both of which have been running slower than they were a year ago. This added activity will increase the consumption of electric energy and will help raise car loading figures.

Net Effect—The sum total may not reach the all-time high level of late 1956 (168 on STEEL's index, Page 53) because there is not as much steam behind the economy this year as there was then. But a high of 165 on the index shouldn't be out of reach. That's only about 7 per cent above the preliminary figure of 154 for the week ended Aug. 19. In 1956, the difference between the corresponding week and the high point of the fourth quarter was 9 per cent; in 1955, it was 8 per cent; in 1954, a whopping 14 per cent.

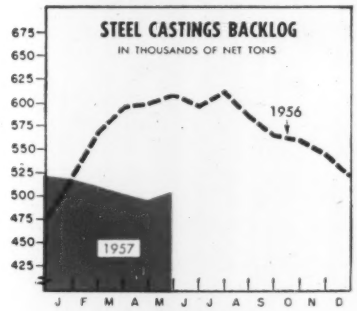
FRB Records Improvement

Over-all, the year so far has been better than the corresponding period of 1956. The Federal Reserve Board confirms this belief by announcing that its production index for July leveled with June at 144 per cent of the 1947-49 base period. That's just 3 percentage points beneath the record set last December. For the first seven months, 1957 is ahead of the corresponding 1956 period with an average of 144.6 to 141.1, counting strike depressed July of last year. Through the first half, the primary metal index lagged behind its 1956 counterpart because of weaker conditions in the nonferrous industry. But with the addition of July, the 1957 monthly average jumped ahead, 136.7 to 133. Despite reports of slow business from some of the major metal fabricators, the index for this segment of industry continues to show unusual midsummer strength. July's 178 brought the seven month average to 177.9, compared with the year-ago average of 168.4.

In addition, the Commerce and Labor Departments reveal that the most inclusive barometer of all, gross national product, reached a record annual rate of $434.5 billion during the second quarter, $5 billion higher than in first quarter and $23.5 billion above the second quarter of 1956.

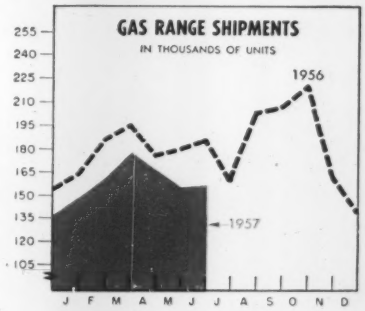
Income Continues Up

To top it all off, there is more money in the hands of consumers today than ever before. Personal



	Shipments		Unfilled Orders*	
	1957	1956	1957	1956
Jan.	169.2	158.7	519.6	519.4
Feb.	154.9	165.4	511.8	567.3
Mar.	160.1	170.0	503.4	595.0
Apr.	162.5	163.7	497.6	600.2
May	164.6	178.2	505.0	608.3
June	....	164.7	....	597.1
July	....	118.0	....	611.2
Aug.	....	160.0	....	586.5
Sept.	....	155.0	....	563.0
Oct.	....	175.6	....	558.5
Nov.	....	164.1	....	545.9
Dec.	....	158.7	....	521.8

*For sale. U. S. Bureau of the Census.



	Shipments—Units		
	1957	1956	1955†
Jan.	149,400	163,500	153,400
Feb.	161,700	190,200	186,500
Mar.	179,100	194,400	218,100
Apr.	167,700	176,500	183,200
May	155,700	179,700	187,700
June	157,000*	185,300	204,000
July	.....	158,600	146,300
Aug.	.....	202,900	220,000
Sept.	.....	207,300	219,100
Oct.	.....	219,100	210,300
Nov.	.....	161,100	184,400
Dec.	.....	138,700	153,600
Totals	.....	2,177,300	2,226,600

*Preliminary.
†Excluding built-ins.
Gas Appliance Mfrs. Assn.

income in July reached a seasonally adjusted rate of $345.5 billion, about $750 million more than in June. Record employment of 67,221,000 helped boost the rate, as well as higher wages and larger dividend payments. Corporations issuing public reports paid out cash dividends of $764 million last month, compared with $732 million in the year-ago month. So far in 1957, dividends amount to $6.3 billion, 3.5 per cent above the corresponding period of last year.

Construction Looks Good

The weather vanes on the construction business barometer point to fair and continued improvement. *Engineering News-Record* reports that while its tabulation for 1957 heavy construction awards is still 14 per cent behind the year-ago pace, the gap has narrowed from the 17 per cent at the end of June. Private awards staged a comeback in the week ended Aug. 15.

Housing starts in July were at the seasonally adjusted annual rate of 980,000 for the second consecutive month, reports the Department of Labor. This raises the annual rate for seven months to 960,000.

Part of the brightness in the over-all construction picture can be attributed to the federal highway program. Bertram D. Tallamy, administrator of the program, says that contracts for 232 miles of the system (worth $122 million) were awarded in July. In the 13 months since passage of the Federal Aid Highway Act, almost $2.6 billion has been programmed.

Trends Fore and Aft

- The Resistance Welder Manufacturers Association reports that net new orders in July totaled $1,943,050, practically the same as in June.
- Most of the 205 industrial concerns polled by the National Industrial Conference Board are optimistic about orders, production, and profits this fall.
- Business failures in July totaled 1059, slightly below June's figure and slightly above the July, 1956, mark, says Dun & Bradstreet Inc.
- Dollar volume of orders received by material handling equipment producers in June dropped 23.1 per cent under the May volume, reports the Material Handling Institute Inc. Business for the first six months is 46.19 per cent of the total received in 1956.

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IF METALWORKING PLANTS ARE YOUR PROSPECTS

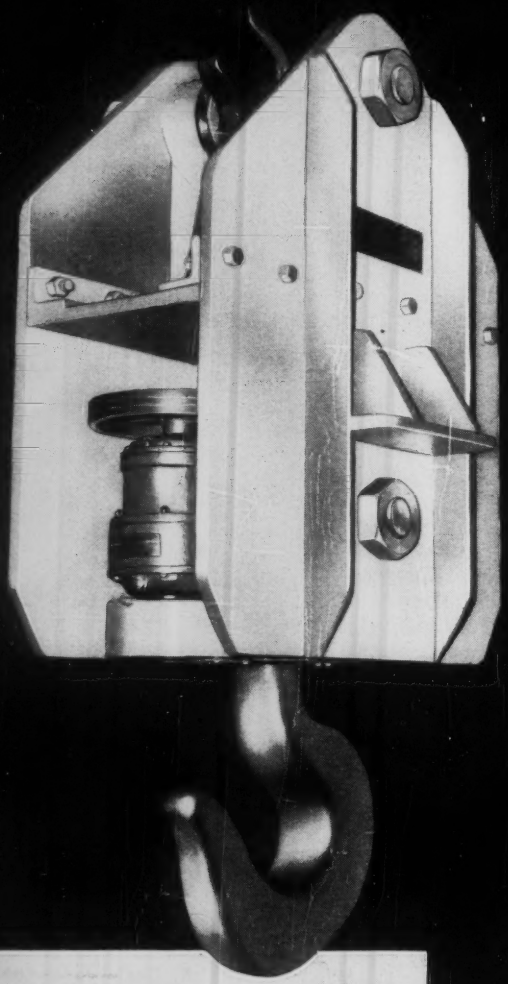
STEEL can put you in touch with the important ones, those that do more than 92% of the industry's business. Tell the buyers and specifiers in these plants of the machines or materials you have for sale through an "Equipment — Materials" advertisement. For rates write STEEL, Penton Building, Cleveland 13, Ohio.

another step in . . .

PRODUCTIVITY

the Motorized Rotating Crane Hook

by HEPPENSTALL

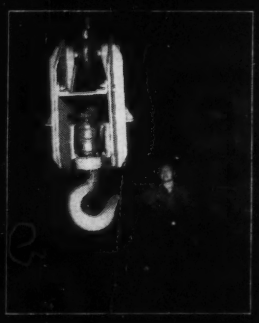


. . . Here is the latest development in the Heppenstall line of Tongs. It is the new motorized rotating crane hook designed by Heppenstall Engineers for use with existing crane blocks and hooks.

Features of this new Crane Hook are:

1. Turns all sorts of loads such as: coils, sheets, rolls.
2. Hook rotates a full 360 degrees in either direction.
3. All operations of the Heppenstall Motorized Rotating Crane Hook are controlled by the craneman from his cab.
4. A load cell can be incorporated with the hook recording weight of each load as it is lifted.
5. Capacities for largest industrial cranes.

Used with a "C" hook, the Heppenstall Motorized Rotating Crane Hook permits a coil of steel to be turned horizontally as it is lifted.



Electric motor furnishes power for turning the hook. Motor can be supplied to meet your current characteristics.

HEPPENSTALL

. . . tongs for every lifting problem.

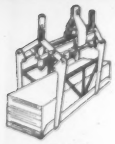
Send for complete information. Heppenstall Engineers will be pleased to help you adapt this new Heppenstall Motorized Rotating Crane Hook to your Production requirements.

Write to Heppenstall Co., New Brighton, Pennsylvania.

Tongs to lift Coil Horizontal around O.D.

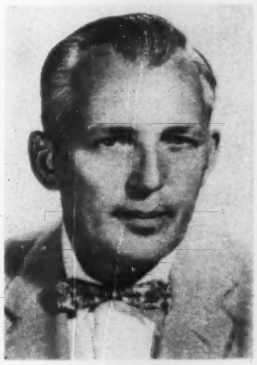
Horizontal Coil Tong over ends

Tongs for lifting groups of rounds



Sheet lifter

ALVAN MARKLE
Walworth dir. of purchases



KENNETH P. MARTIN
LeMaire vice pres.-gen. mgr.

GEORGE E. DRAKE
Electro Metallurgical post

GEORGE M. HUMPHREY
National Steel chairman

Alvan Markle joined **Walworth Co.**, New York, as director of purchases. He was purchasing manager, Crown Cork & Seal Co.

Kenneth P. Martin was appointed vice president and general manager of **LeMaire Tool & Mfg. Co.**, Dearborn, Mich. He was vice president, National Automatic Tool Co.

R. M. Naley was made vice president of **Aluminium Ltd. Sales Inc.**, New York, subsidiary of Aluminium Ltd. He was secretary.

Harold A. Tucker was made manager of marketing research, **Brainard Steel Div.**, Warren, Ohio, Sharon Steel Corp. He will conduct marketing research for the three Brainard producing units: building products, steel strapping, and strip and tube.

Milton C. Knight was appointed sales manager of the Industrial Div., **Swan-Finch Petrochemicals**, Chicago. He was sales manager-Eastern Div.

McDowell Co. Inc., Cleveland, appointed **Ellison Wefel** chief engineer of the Anker-Holth Div. of its manufacturing affiliate, Wellman Engineering Co., at Port Huron, Mich. He was vice president, Lombard Corp.

Pickands Mather & Co. named **Richard E. Haas** superintendent of the Erie Dock Co. and P. & E. Coal Dock Co., both of Erie, Pa., to succeed the late **Norbert A. Lechner.**

George E. Drake was appointed vice president in charge of sales of **Electro Metallurgical Co.**, a division of Union Carbide Corp., New York. He was assistant general manager of the Silicones Div.

Assembly Products Inc., Chesterland, Ohio, appointed **Frank L. Ross** manager of quality control. He was a quality control and product design engineer at Brush Electronics Co.

John J. Egan Jr. has joined **Van Straaten Chemical Co.**, Chicago, as general sales manager. He was northeast sales manager, Ramset Div., Olin - Mathieson Chemical Corp.

U. S. Steel Corp. appointed **Dr. Lawrence S. Darken** associate director of its Fundamental Research Laboratory, Monroeville, Pa. He was assistant director-physical chemistry.

W. F. Mericle joined the **Cincinnati Shaper Co.**, Cincinnati, Ohio, as export sales manager.

Byron B. Clow was named assistant product manager, forgings, in Chicago for **Kaiser Aluminum & Chemical Sales Inc.**, He was manager of sales planning in the business analysis and market planning department.

Dean W. Cardwell was promoted to Multigraph assistant sales manager, **Addressograph - Multigraph Corp.**, Cleveland. He was Multigraph branch manager at San Francisco.

George M. Humphrey returned to **National Steel Corp.**, Pittsburgh, with his election as chairman. A founder of the corporation, he became a member of the board and chairman of its executive committee when it was organized in late 1929 and continued in both capacities until he became secretary of the treasury in President Eisenhower's cabinet in 1953. Mr. Humphrey resigned the Treasury post on May 29, but remained in the Cabinet until July 29.

Thomas H. Armstrong fills the new post of manager, "Bizmac" sales plans and programs, Industrial Electronic Marketing Dept., **Radio Corp. of America**, New York. He was vice president-marketing, Underwood Corp.

Robert J. Roberts was promoted to the new position of manager of commercial sales, **Steel Improvement & Forge Co.**, Cleveland.

Armin M. Elbert was named chairman of the finance committee of **Controls Co. of America**, Schiller Park, Ill. He is succeeded as treasurer by **John P. Ruane**, formerly controller. **Ernest A. Weberling**, becomes controller.

Solar Steel Corp., named **Hugh Trumbull** plant manager of its Worcester, Mass., plant. He was its New England sales manager. **Jordan D. Raileanu** was made assistant plant manager.

Richard C. Hahn was made assistant sales manager - components, **Victoreen Instrument Co.**, Cleve-

ROBERT D. CRANE
Dresser purchasing mgr.

BERNARD PERLIN
Calcor division mgr.

A. H. CASSIDY
Aeroquip div. sales mgr.

JOHN J. CLEMENS
Dow Chemical section head

land. He was an electronics engineer, Clevite Research Center of Clevite Corp.

Dresser Mfg. Div., Dresser Industries Inc., Bradford, Pa., named **Robert D. Crane** to the new post of manager of purchasing and **Lyman D. Warner** as manager of subsidiaries. Mr. Crane was assistant to the general manager-purchasing and Mr. Warner, assistant to the general manager-sales.

R. E. Tennery was appointed general superintendent of **Link-Belt Co.'s** Los Angeles plant. He was general superintendent at its Seattle plant.

Malcolm G. Douglas was named director of sales and service, Montrose Div., South Montrose, Pa., **Bendix Aviation Corp.** He was sales manager.

B. S. Burke joined **Federal Pacific Electric Co.** as manager of its Great Lakes sales region with headquarters in Cleveland. He was with Westinghouse Corp.

H. H. Robertson Co., Pittsburgh, named **William A. Miller** manager of its Ventilation Dept. and **Donald G. Havlish** manager of its Q-Floor-Q-Deck Dept.

Robert W. Thomas has been promoted to manager of **Trane Co.'s** New York office. He was a sales engineer in its Los Angeles office.

George W. Hoffmeister was made general superintendent of **Minneapolis-Honeywell Regulator Co.'s** new plant at Fall River, Mass. He was supervisor of assembly operations in Philadelphia.

Calcor Corp., Los Angeles, promoted **Bernard Perlin** to general manager, steel building division. He was chief engineer. **Edward Lindskog** was made manager, sales and engineering of structural products.

C & D Batteries Inc., Conshohocken, Pa., appointed **Dr. Eugene Willihnganz** to the new post of director of research.

David R. Bailey was named assistant to the superintendent of the open hearth department, Monessen, Pa., Works, **Pittsburgh Steel Co.** He was works metallurgist.

Fafnir Bearing Co., New Britain, Conn., appointed **Matthias P. Rival** chief plant engineer, succeeding **John W. Smith** who retired Aug. 1. **Vladimir Mackas** was named assistant chief plant engineer.

Robert K. Henderson was appointed manager of sales of the Philadelphia sales office, **National Tube Div.**, U. S. Steel Corp.

Robert T. Huyck was named director of research and engineering, **Roberts-Gordon Appliance Corp.**, Buffalo. He was manager of its Industrial Burner Div.

Lloyd W. Root was appointed director of research for the precision optical glass division of **George Behm & Sons Co.**, Dayton, Ohio. He was associate professor of physics at the University of Dayton.

John B. Graef was named manager-aviation industry sales, **Westinghouse Electric Corp.**, Pittsburgh. He was manager of engine sales.

Aeroquip Corp., appointed **A. H. Cassidy** industrial sales manager at its Marman Div., Los Angeles; **William H. Rowley**, manager-military requirements, Jackson Div., Dayton, Ohio; and **Fred W. Schwier**, assistant to the aircraft sales manager, Jackson Div.

John J. Clemens heads a new magnesium sales section for **Dow Chemical Co.**, Midland, Mich. The section will market big magnesium and aluminum extrusions made by the company's new 13,200-ton press.

Dr. Robert W. Lindsay will join **Crucible Steel Co. of America** as supervisor of constructional alloy steels at its research laboratory in Pittsburgh on Sept. 1. He was professor of metallurgy at Pennsylvania State University.

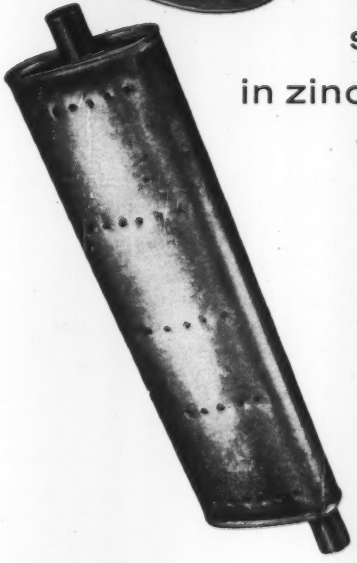
Francis B. Foley was named executive metallurgical engineer of **Pencoyd Steel & Forge Corp.**, Philadelphia. He was consulting metallurgist to International Nickel Co.

K. A. Lang was made general manager of **Lindberg Engineering Co.'s** manufacturing plant in Downey, Calif. He was manager of the Lindberg-Fisher Melting Div.

Beryllium Corp., Reading, Pa., named **William H. Santschi** associate director of research-fabrication metallurgy and **Kenneth B. Higbie**, associate director of research—process and extractive chemistry and metallurgy.

Brooks Rotameter Co., Lansdale, Pa., made **George D. Keller** chief engineer. He was with Penn In-

These five drawing operations in production of a muffler part illustrate outstanding adherence and formability of JALZINC.



sets the pace in zinc coated steel with superior drawing and forming properties

JALZINC, Jones & Laughlin's high quality zinc coated steel, has a tight uniform coating that resists cracking and flaking during forming or drawing. The uniform luster surface finish improves product appearance after even the toughest fabrication operation.

Improved adherence and ductility of the zinc coating is due to the modern Sendzimir continuous galvanizing line. Only the JALZINC base metal controls your limits of bending, forming and drawing.

JALZINC is available in a wide range of gages and widths in both cut lengths and coils. It can be furnished in various coating weights depending on your end product needs.

Call your local J&L district office for details, or write to the Jones & Laughlin Steel Corporation, Dept. 404, 3 Gateway Center, Pittsburgh 30, Pennsylvania. For out of stock requirements, call your local steel warehouse or sheet metal distributor.

Jones & Laughlin STEEL ... a great name in steel

P. H. DREISSIGACKER
Farrel-Birmingham sales mgr.

LYLE L. CLARK
Fansteel plant manager

JOHN N. HOWLETT
Morrison Products div. mgr.

dustrial Instrument Corp. as vice president and general manager.

Farrel-Birmingham, Co. Inc., Ansonia, Conn., made **Philip H. Dreissigacker** sales manager in charge of sales and engineering for rolls, roll grinders, industrial and marine gears, cane sugar mills and auxiliary equipment, and special machinery and castings.

Charles H. Atwood has been appointed president (effective Sept. 1) of **Union Carbide Caribe Inc.**, a subsidiary of Union Carbide Corp. The subsidiary will operate the petro-chemicals plant under construction near Ponce, Puerto Rico.

B. William Sauter was promoted from manager of the Bath, N. Y., plant of **Westinghouse Electric Corp.** to general manager of its Electronic Tube Div. in Horseheads, N. Y.

International Business Machines Corp., New York, appointed **Donald B. Otis** as director of planning for its Military Products Div. He was controller of its Kingston, N. Y., Military Products plant. **John N. Raines** was made manager of marketing for the division.

Carpenter Steel Co., Reading, Pa., named **Lester Cooney** assistant to the vice president-sales; **Paul W. Holtz**, district manager of Chicago-Milwaukee-St. Louis area; **William J. Stephens**, branch manager in Chicago; **M. R. Gerhart**, branch manager in St. Louis; **Martin J. Holleran**, district manager of the northern New Jersey territory; and **Kenneth C. Largent**, branch manager of the San Francisco mill-branch warehouse.

Fansteel Metallurgical Corp. appointed **Lyle L. Clark** manager of Muskogee operations. Former supervisor of foundry research at Armour Research Foundation of the Illinois Institute of Technology, he will be in charge of the company's tantalum-columbium plant now under construction near Muskogee, Okla.

John N. Howlett was made manager Wheel Guard Div., **Morrison Products Inc.**, Cleveland.

Lou Herman was made district sales manager, **Celfor Tool Co., Div.**, Avildsen Tools & Machines Inc., with headquarters in Glendora, Calif.

Ferro Corp., Cleveland, appointed **Henry W. Fishkin** manager-New York sales service district, Frit & Glaze Div. He succeeds **William H. Wilson**, retired.

Robert A. Brown was appointed to the new post of vice president-general sales manager, **Borg-Warner International Corp.**, Chicago. He was treasurer.

Robert D. Ridgway was promoted to manager-sales operations, **Consolidated Electrodynamics Corp.**, Pasadena, Calif. He was assistant manager-sales operations.

Roy Norton was made assistant director of engineering, **Long Mfg. Div.**, Borg-Warner Corp., Detroit. He was transmission engineer.

Radio Corp. of America, New York, named **Thompson H. Mitchell** general manager of a new Telecommunications Div. in its newly formed Industrial Electronic Products organization. He continues as president of RCA Communications Inc. **A. R. Hopkins** was promoted to manager, Industrial Electronic Marketing Dept.

R. W. Reeve was named assistant sales manager-International Div., **Addressograph - Multigraph Corp.**, Cleveland.

Edward J. Hirshberg was named vice president of **Tube City Iron & Metal Co.**, Glassport, Pa. He will head a newly created sales development department.

Homer T. Pittman was named vice president - manufacturing, **F. C. Russell Co.**, Cleveland. He was director of manufacturing.

L. M. Walker was made sales manager of **Westinghouse Electric Corp.'s** manufacturing and repair plant in Houston. He was manager of industrial apparatus for the agency and construction headquarters sales department in Pittsburgh.

OBITUARIES...

Frank J. Laskey, 70, retired director of purchases, **Republic Steel Corp.**, Cleveland, died Aug. 14.

Ralph C. Archer, 65, vice president - manufacturing, **International Harvester Co.**, Chicago, died Aug. 11.

Ulrich Eberhardt, 85, retired treasurer, **Gould & Eberhardt, Inc.**, Irvington, N. J., died Aug. 11.

Porter S. Morgan, 65, vice president, **Morgan Development Laboratories Inc.**, Westport, Conn., died Aug. 13.

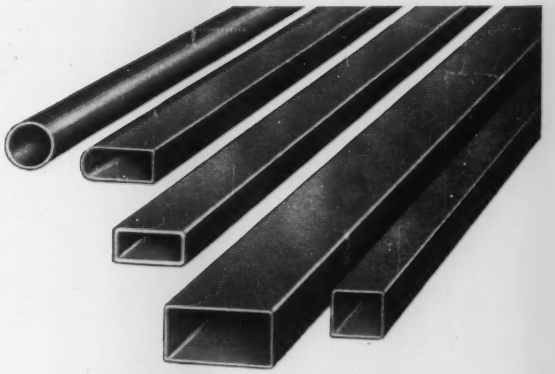
Joseph H. Bridge, 77, founder and former president, **Maumee Pattern & Mfg. Co.**, Toledo, Ohio, died Aug. 6.

J. Raymond Schroll, 52, president, **Manufacturers Equipment Co.**, Dayton, Ohio, died Aug. 6.

Raymond H. Queeman, 65, purchasing agent, **Wehr Steel Co.**, Milwaukee, died Aug. 8.

Ralph J. Dellatess, 52, vice president, **Raymond Steel Corp.**, San Diego, Calif., died July 28.

Another Plus . . . from Brainard



Tubing:

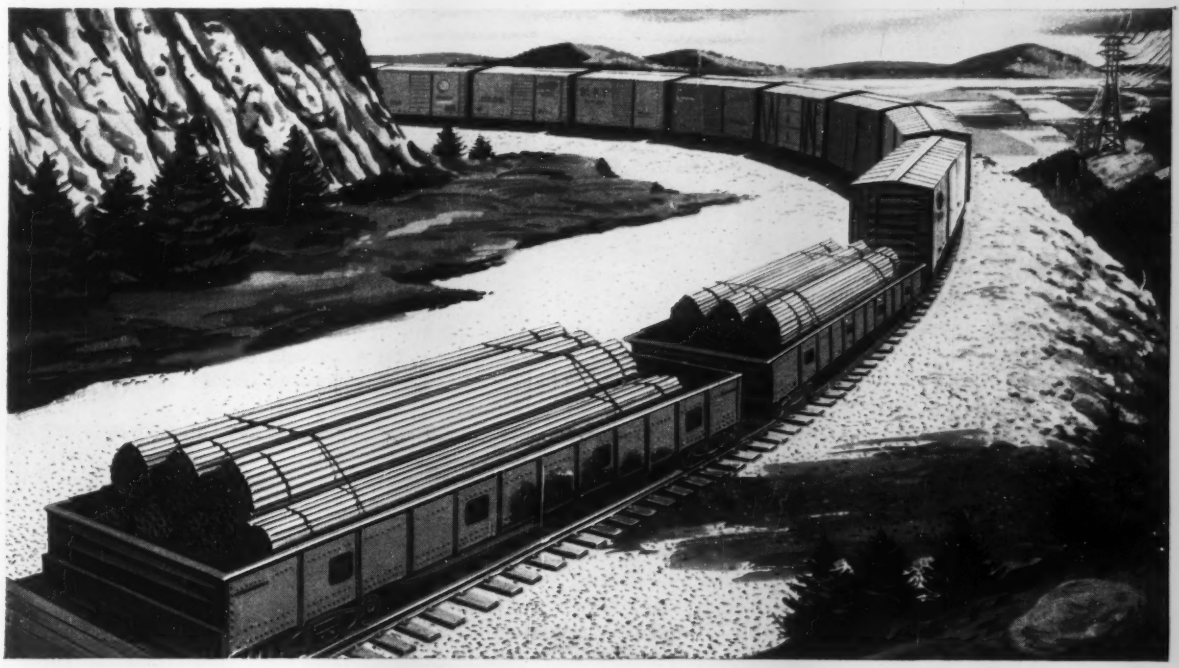
Assured delivery from an integrated mill...

As a buyer of steel tubing, what does the phrase . . . "from an integrated mill" mean to you?

To most of our customers it means just this: no company likes to have its markets jeopardized by production slow downs resulting from material shortages. When the "material" happens to be tubing and the supplier is an integrated mill such as Brainard, such shortages are virtually non-existent.

As an integrated mill, Brainard is not dependent on outside material sources. The corporation of which Brainard is a part controls tubing production from raw material source to finished product: thus customers are assured of an uninterrupted supply.

So, whether you buy tubing in small quantities or carload lots, you can benefit from this year-in-year-out dependability of supply by placing your orders with Brainard.

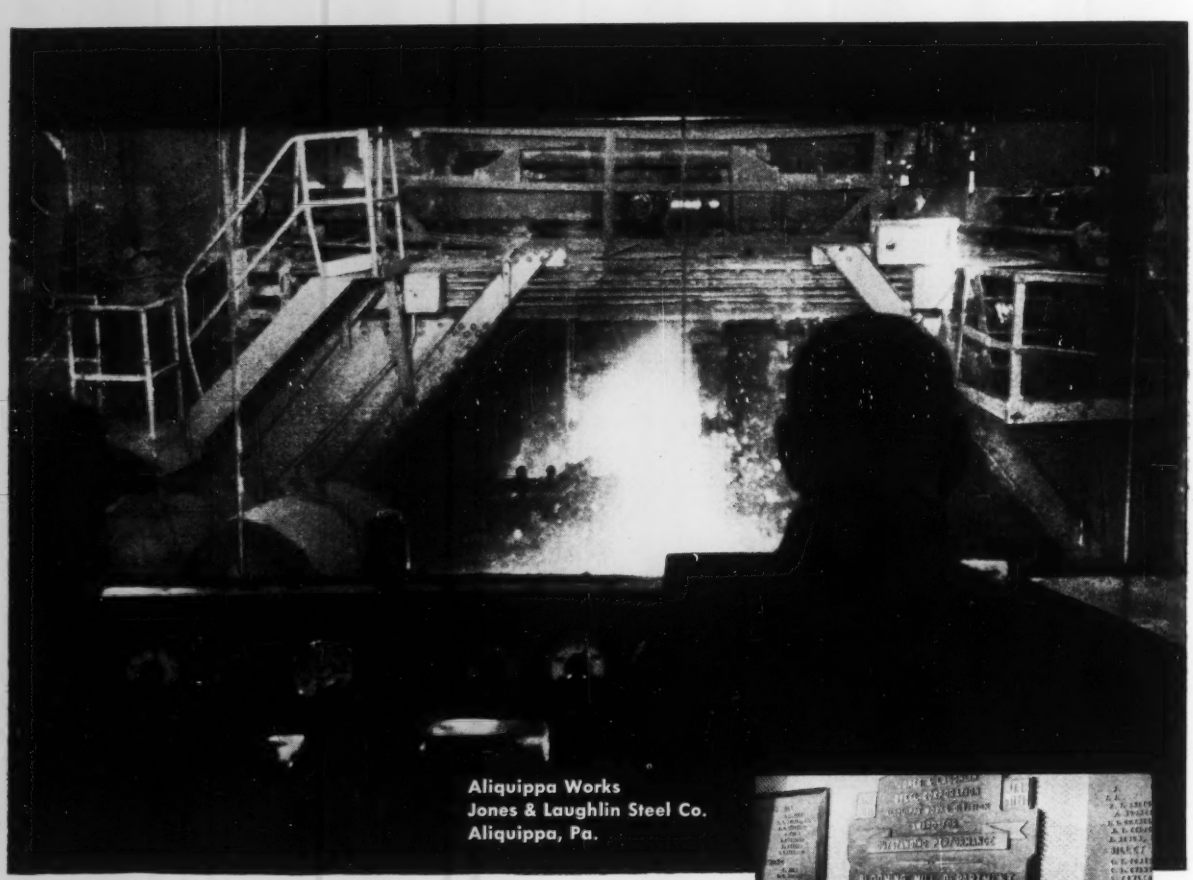


Brainard Steel Tubing

SHARONSTEEL

Brainard Steel Division, Sharon Steel Corporation
Griswold Street, Warren, Ohio

258



Aliquippa Works
Jones & Laughlin Steel Co.
Aliquippa, Pa.

An ingot a minute!

and never a lubrication failure with Cities Service EP-21 Lubricant!

At Jones & Laughlin's Aliquippa Blooming Mill, they believe in production with a capital "P"!

Not only does J&L's Aliquippa Mill hold the world's record for ingots rolled in an eight hour turn (576), but they've set a year-in, year-out average of an ingot per minute!

How do they sustain this production for such long periods?

One answer lies in their modern, 44-inch, two-high reversing unit, powered by four 3000 h. p. motors arranged in tandem twin drive.

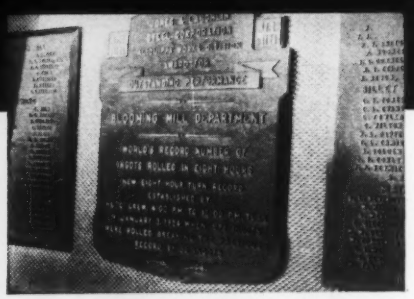
Another can be found in their lubricant . . . Cities Service EP-21.

Used on main bearings, manipulator slides and window liners, Cities Service EP-21 and its superior additives provide an unusually tough film . . . tough enough to stand the highest pressures, the greatest shock loads with no loss of lubrication, no danger of rust or corrosion.

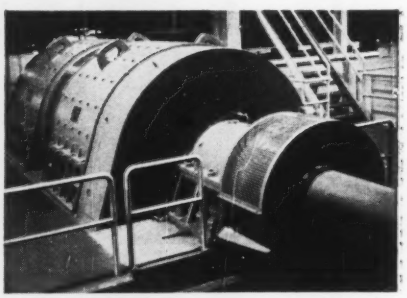
Yes, Jones & Laughlin is pleased with Cities Service lubricants! You'll feel the same when Cities Service goes to work in your operation. Talk with your Cities Service Lubrication Engineer. Or write: Cities Service Oil Company, Sixty Wall Tower, New York 5, N. Y.

CITIES SERVICE

QUALITY PETROLEUM PRODUCTS



Award for 8-Hour Turn Record is displayed proudly outside mill. J&L smashed previous record by 38 ingots—rolled up new total of 576! Year-in and year-out, the plant averages an ingot a minute, with flawless lubrication provided by Cities Service.



Four 3000 h.p. Motors power the blooming mill at J&L's Aliquippa Works. These are 70 to 140 rpm, double-armature units arranged in tandem twin drive. At 70 rpm, they can reverse in under a second. Equally flexible is the mill's lubricant—Cities Service EP-21.

Use Foreign Outlets

Domestic and foreign machine toolmakers are opening up important new markets

DOMESTIC and foreign machine tool companies are broadening their markets by licensing firms outside their home countries to manufacture their products or by establishing subsidiaries.

Swiss Machine — The exclusive license to manufacture and sell the No. 12 Fellows-Reishauer gear grinding machine in the U. S. and Canada has been granted to the Fellows Gear Shaper Co., Springfield, Vt., by Reishauer Tool Works Ltd., Zurich, Switzerland.

Lagonda Equipment — Chicago Pneumatic Tool Co., New York, and the Elliott Co., a division of Carrier Corp., Springfield, Ohio, have completed negotiations for the manufacture and sale of the Lagonda type tube cleaners, cutter heads, tube expanders, and related equipment.

The agreement provides for the Consolidated Pneumatic Tool Co. Ltd., London (a subsidiary of Chicago Pneumatic) to manufacture to Elliott domestic specifications and to provide sales and service facilities throughout the Sterling Area.

Cincinnati Shaper Co., Cincinnati, has organized a subsidiary, Cincinnati Shaper Co. Ltd., for the manufacture of metalworking machinery in Great Britain. David H. March, vice president of the parent company, is managing director of the new subsidiary.

Canadian Tool Firm Expands

Canada Illinois Tool Ltd., subsidiary of Illinois Tool Works, Chicago, is adding 25,000 sq ft of floor area to its new factory at 67 Scarsdale Rd., Don Mills, Ont. This expansion will accommodate the plant now in downtown Toronto, where the firm's line of metal cutting tools is manufactured.

Strip, Sheet Producer Renamed

Life Time Products Corp., Canfield, Ohio, changed the name of its Coated Steel Div. to Canfield Steel Co. The tradename, Lifekote, was adopted for the electrogalvanized and pre-enameled strip and sheet steel produced by the subsidiary.

Midwestern Moves Division

Midwestern Instruments Inc., is moving its Magnecord Div. from Chicago to its main headquarters in Tulsa, Okla.

Reynolds Changes Name of Plant

Reynolds Metals Co., Louisville, changed the name of its La Quinta alumina plant at Corpus Christi, Tex., to Sherwin. The plant was renamed in memory of the late R. S. Sherwin Sr., a former Reynolds' vice president and an authority on alumina.

Installs Tube Inspection Unit

Magnaflux Corp., Chicago, has shipped a magnetic particle unit to Algoma Steel Corp., Sault Ste. Marie, Ont., which is designed to inspect tube rounds 12 to 40 ft long and 4.5 to 10 in. in diameter. Maximum magnetizing current is 6000 amperes. The unit will eliminate the pickling operation used for the removal of scale to allow visual spotting of surface defects. Handling equipment to function with the unit will provide a high degree of automation in moving the tube rounds.

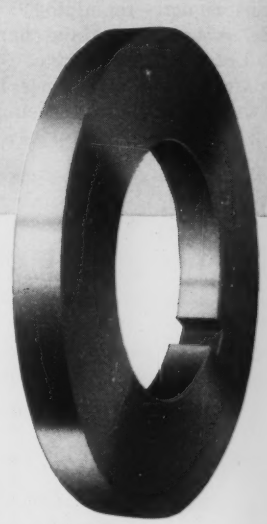
Servel Selling Two Divisions

Servel Inc., Evansville, Ind., sold its All-Year Air Conditioning Division to Arkansas Louisiana Gas Co., Shreveport, La., subject to approval by Servel stockholders. Servel also is negotiating for the sale of its Home Appliance Division and its general offices.

Organizes Polishing Firm

Berger-Iding Polishing Inc. has been organized at 3420 W. Pierce St., Milwaukee, Wis. The company will be able to handle metal sheets up to 60 in. wide, 14 ft long and ½-in. thick. C. W. Berger, president, says the firm will specialize in applying a polished finish to stainless steels, copper, aluminum, and other metals used in the construction of tanks and vessels for

COWLES
TRIMMING KNIVES



Assure more continuous production and more tonnage from each grind

Cowles knives stay on the job longer. They keep mills in continuous production with minimum downtime for knife changes. Manufactured from individually hammered forgings, and heat treated to assure maximum durability, they meet industry's most exacting requirements. Any diameter, face or bore. Widely used by all principal producers and processors. *Let us quote on your requirements!*

COWLES TOOL COMPANY
2050 WEST 110th STREET • CLEVELAND 2, OHIO

Specializing in the Manufacture of
ROTARY SLITTING KNIVES • SPACING COLLARS • ROTARY TRIMMING KNIVES • ROLL TURNING TOOLS • EDGING ROLLS • CUT-OFF KNIVES STANDARD AND SPECIALLY ENGINEERED TOOLS FOR ALL FERROUS AND NON-FERROUS PROCESSING, TRIMMING AND FORMING REQUIREMENTS.

the dairy food industries. Other officers are: Vice president, Joseph Iding; treasurer, Robert Crane; secretary, James Mallien.

Share $10-Million Order

Wean Engineering Co., Warren, Ohio, and United Engineering & Foundry Co., Pittsburgh, are sharing a $10-million order for steel equipment for Fuji Iron & Steel Co. Ltd. of Japan. Wean will build a continuous annealing furnace while United will build a 160 in., 4 high, reversing cold mill. The project is being financed with a loan to Fuji from the Import-Export Bank, Washington. Fuji is engaged in an $89-million expansion program at its Hirohata Works in Japan.

Buffalo Plating Firm Builds

Tripp Plating Works Inc., commercial plater, is erecting a plant at 1491 William St., Buffalo, N. Y. It will cover 6500 sq ft of floor space.

Fageol Sells Rebuilding Unit

R. D. Fageol Co., Kent, Ohio, sold its Trans-Main Div. (bus transmission rebuilding) to the PSC Automotive Maintenance Co., St. Louis, a subsidiary of St. Louis Public Service Co. Items included in the transaction are being moved to St. Louis.

CONSOLIDATIONS

Dominion Brake Shoe Co. Ltd., Montreal, Que., acquired **Manitoba Foundries & Steel Ltd.,** Selkirk, Man. Dominion Brake Shoe is a subsidiary of American Brake Shoe Co., New York; Manitoba Foundries, of Vulcan Iron & Engineering Ltd., Winnipeg, Man. A. C. Montgomery will continue as manager of the Selkirk facilities. Sales activities will be integrated with those of Joliette Steel Div., Joliette, Que.

Stolper Steel Products Corp., Menomonee Falls, Wis., purchased **Allen Industrial Products Inc.,** Battle Creek, Mich., and will soon move the operation to Menomonee Falls. Allen makes operator's cabs for industrial trucks, tractors, and various types of construction equipment; snowplows; lift truck shovels; hydraulic paper lifts; and aluminum trailers.

Bell Aircraft Corp., Buffalo, purchased **Birma Mfg. Co. Inc.,** fabricator of molded fiber glass products. Birma has plants in Greenfield, Ind., and Buffalo.

NEW PLANTS

Herman Stone Co., Dayton, Ohio, opened a plant in Mt. Airy, N. C. The firm makes granite surface plates as a base for industrial precision measurements.

Proctor Electric Co., Philadelphia, will begin production in its new toaster manufacturing plant in Mt. Airy, N. C., on about Oct. 1. The firm's executive offices will remain in the Philadelphia area.

NEW ADDRESSES

E. W. Bliss Co., Canton, Ohio, moved its New York sales office to 65 Adams St., Brooklyn 1, N. Y. The firm makes metalworking presses, rolling mills, canmaking machinery, and other manufacturing equipment.

Manufacturers Supply Co., industrial distributor, moved to its new building at 2851 Buchanan Ave. S.W., Grand Rapids, Mich. Featured among its lines: Whitman & Barnes drills, reamers, carbide tools, and end mills; Norton grinding wheels and abrasives; Gardner-Denver pumps and compressors.

Brooks Rotameter Co. moved to a new plant in Hatfield, Pa. The firm makes rotameter flow measurement instruments and accessories.

Wausau Motor Parts Co. moved into a new 40,000 sq ft plant in Schofield, Wis. Wausau makes automotive piston rings. George C. Landon is president.

NEW OFFICES

Commercial Shearing & Stamping Co., Youngstown, opened a southwestern regional sales office in the Exchange Bank Bldg., Dallas, Tex. C. J. Butler is manager of the sales area.

Pittsburgh-Des Moines Steel Co., Pittsburgh, opened an office in the Railway Exchange Bldg., Denver. The company is an engineering, fabricating, and contracting firm.

Bristol Co., Waterbury, Conn., opened a sales office at 2210 N.W. Roosevelt Ave., Portland, Oreg. Lyle R. Koroch is sales engineer for the territory.

ASSOCIATIONS

Refractories Institute, Pittsburgh, elected J. E. Brinckerhoff president. He is vice president of Babcock & Wilcox Co., New York.

William W. Mee was appointed executive director of the **Point-of-Purchase Advertising Institute,** New York.

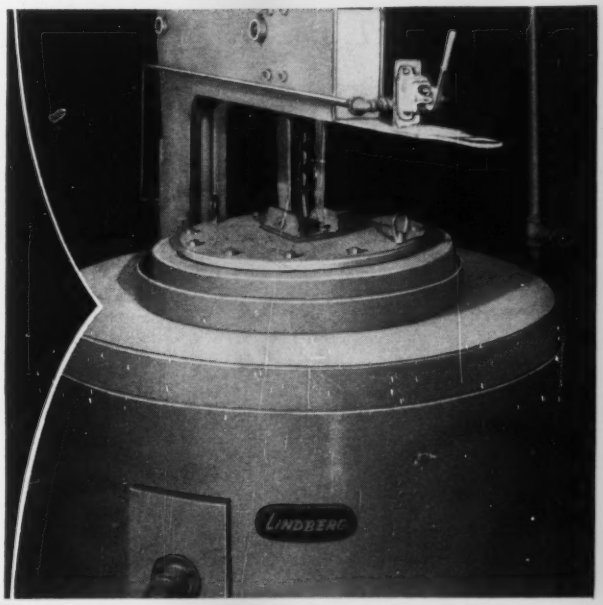
Charles H. Topping, senior architectural and civil consultant for E. I. du Pont de Nemours & Co., Wilmington, Del., was elected president of the **Building Research Institute,** Washington. H. L. Humes, Baldwin-Hill Co., Trenton, N. J., was elected vice president. The institute is part of the National Academy of Sciences-National Research Council, a private nonprofit organization chartered by Congress.

Joseph E. Foster, former assistant to the technical director of the American Foundrymen's Society, has been appointed associate editor of the *Metals Handbook,* published by the **American Society for Metals,** Cleveland. James J. Kubbs, chief metallurgist, Jeffrey Mfg. Co., Columbus, Ohio, also was appointed associate editor.

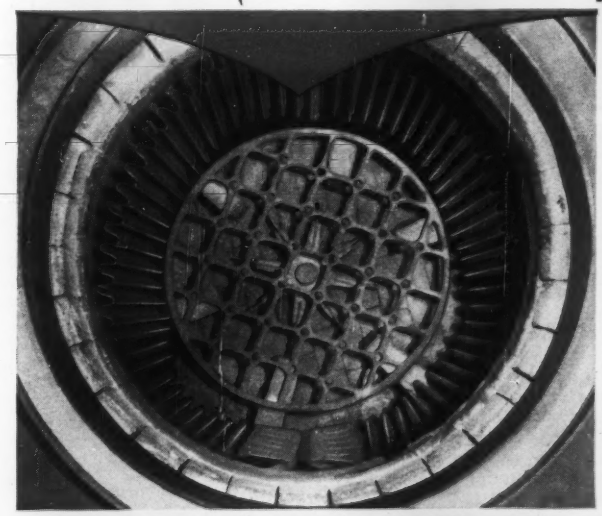
Robert B. Little, Reliance Div., Eaton Mfg. Co., Massillon, Ohio, was elected president of the **Helical Spring Washer Institute.**

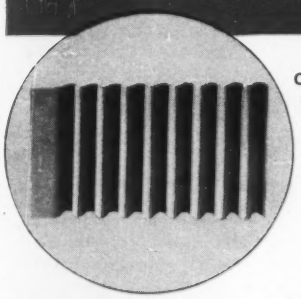
FROM THE OUTSIDE

. . . JUST ANOTHER LINDBERG PIT-TYPE CARBURIZING FURNACE

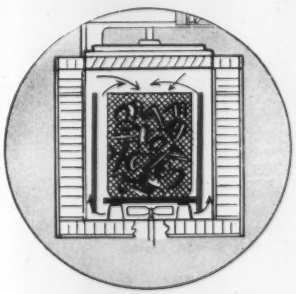


BUT LOOK INSIDE





CORRTHERM elements operate on extremely low voltage. No leakage through carbon saturation. Shock or short hazards eliminated. No complicated mountings required. An exclusive Lindberg development.



Note how CORRTHERM elements serve as baffles to direct forced convection streams through the charge.

No Retort!

Because it needs no retort, this new Lindberg electric vertical pit-type furnace gives you these important advantages:

- **Lower initial cost, no retort to pay for.**
- **No expensive retort replacement.**
- **Downtime for retort replacement eliminated.**
- **Increased production because it heats faster.**
- **Exact atmosphere control maintains work quality.**
- **Versatile, carbon-diffusing and requenching along with carburizing. Adaptable to variety of work.**

All this is made possible by Lindberg's new CORRTHERM electric heating element. For lower initial cost, lower maintenance costs, faster production, better quality control, why not look into this furnace. It's additional evidence that, if you're concerned with the application of heat to industry, better talk it over with Lindberg.

LINDBERG

ENGINEERING COMPANY

2441 West Hubbard Street, Chicago 12, Illinois

Los Angeles Plant: 11937 S. Regentview Ave., at Downey, Calif.
Toronto Plant: EFCO-Lindberg, Ltd., 11 Front Street, East

TWO GREAT BEARING DEVELOPMENTS ROLLED INTO ONE!

PLYA-SEAL WIDE INNER RING BALL BEARING

Designed expressly for slow speed applications and wet or dirty operating conditions

New Fafnir Plya-Seal Wide Inner Ring Ball Bearings are a combination of two outstanding bearing developments. The most effective seal ever devised for retention of grease and protection against contamination, plus the famous Fafnir self-locking collar, for cost-cutting, twist-of-the-wrist bearing installation. This combination of features offers you several advantages . . .

Best protection yet against dirt, dust, steam, water, lint, other contaminants on slow to moderate speed applications. Contact-type, Plya-Seals seal out abrasive or corrosive material, seal in factory prepacked lubricant.

Less Maintenance — In many applications, non-relubricatable bearings may be used. They require virtually no maintenance time or expense. In other applications, where bearings receive hard or constant use, relubricatable types are available. They require only occasional greasing, even under severe conditions.

Longer Service life — Plya-Seals protect against premature bearing wear or failure. Contaminants cannot damage balls or races; sealed-in lubricant ensures against bearing "running dry".

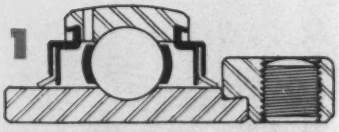
Simplified Designing — Bearing housings may be designed without incorporating separate housing seals. Plya-Seals provide full protection; make possible simplified, less costly, more compact housings.

Power Transmission Units incorporating new Fafnir Plya-Seal Wide Inner Ring Bearing

RAK and RAS Type Pillow Blocks — RCJ Type Flange Cartridges — Fafnir Flangettes

Write for bulletin containing complete specifications on Fafnir Plya-Seal Wide Inner Ring Ball Bearings and Power Transmission Units. The Fafnir Bearing Company, New Britain, Conn.

FAFNIR
BALL BEARINGS
MOST COMPLETE LINE IN AMERICA



PLYA-SEALS

As incorporated in the Fafnir Plya-Seal Wide Inner Ring Ball Bearing, the Fafnir Plya-Seal consists of a synthetic rubber-impregnated fabric sealing washer sandwiched between dished steel plates. Seal flares out, maintaining constant contact with ground outside diameter of inner ring. Years of service have proven Plya-Seals the most effective seal ever developed for ball bearings.

SELF-LOCKING COLLAR

Originated by Fafnir, this famous development has cut costs and simplified assembly throughout industry. Bearings slip onto shaft; are locked securely with simple twist of self-locking collar. No need for lock nuts, shoulders, sleeves, washers, or adapters. Positive binding action increases with use.

Technical Outlook

TUBING LIFESAVER—Prestressing increases the strength and fatigue resistance of stainless tubing, says the Department of Commerce. Air Force-sponsored research shows that formed tubing assemblies are improved by applying a high hydraulic pressure prior to use. Better strength leads to thinner tubing which can save up to 35 per cent in weight. Assembly must not be restrained nor reworked subsequent to prestressing.

PORTABLE INSPECTION TOOL—Budd Co.'s Nuclear Systems Div. has developed a radiography machine that weighs only 40 lb, yet has the penetrating power of a 400,000-volt x-ray machine. It fits into the trunk of a car and can be used for field inspection of welding in pipelines, boilers, pressure vessels, and similar structures. Called "Iriditron 40", it employs Iridium 192 in strengths up to 30 curies (equivalent to 20,000 milligrams of radium).

FERRONICKEL— Electrically smelted Cuban nickel ores will yield a low carbon ferronickel suitable for steel mill use, says the Bureau of Mines. In the bureau's experiments, coke and bagasse were used as reducing agents. Bagasse is sugar cane waste, plentiful in Cuba. Ferronickel made by the bureau has been used to make stainless steel.

PLASMA JET— A beam of electrons and positive ions generating temperatures in the 15,000 to 30,000° F range is close to becoming a metalworking tool. This is about 20,000° F hotter than superheat sources such as the solar furnace and oxyaluminum cutting flame. The beam, or plasma jet, is a high current, electric arc flame which is concentrated by surface cooling and magnetic effects. Some of the things the jet might do: Instantaneous metal cutting; melting and shaping of ceramics; fusing refractories to metals; vaporizing metals for alloying via vapor phase; direct vaporization of rare materials from raw ore.

DRY LUBE— Life and load-carrying ability of dry film lubricants depends on the resin bonding agent used and pretreatment given the metal surface, Air Force tests show. Maximum life of dry film lubricants was obtained when both bearing surfaces were coated. Films containing molybdenum disulfide far outlasted those of graphite.

EXPERIMENTER'S TIMESAVER — Electronic technicians are finding that a new breadboard device greatly simplifies experimental circuit development. Made by Van-Dee Products, Laguna Beach, Calif., the flat board is divided into a grid. Small cells or conductive pockets at the intersection of grid lines hold up to four wires. No solder is needed. The cells are a simple method of making quick connections. Leads can be removed and inserted at will.

INSULATED PANELS— Aluminum Co. of America has started production of foamed-plastic insulated panels for the building, refrigeration, transportation, and similar industries. Panel exteriors can be color anodized or patterned aluminum sheets laminated to plywood, plaster board, or acoustical material. Tubing for heating and cooling can be built into the rigid foamed plastic core. The laminates are being made up to 6 in. thick.

TITANIUM VALVES— They're being made by the Fabri-Valve Co. of America, Portland, Oreg. The 4 in. type weighs 40 per cent less than its stainless counterpart, lasts 15 times longer in corrosive service, says Du Pont.

Metalworking Outlook—p. 29 *Market Outlook—p. 101*

Developments Are in These Areas

Cathodic Protection

It can virtually eliminate corrosion by making the protected metal cathodic in the electrochemical circuit.

Coatings

They isolate the metal from its environment. Cathodic protection used with coatings gives added resistance.

New Ways To Fight Corrosion

LAST YEAR, 46 million tons of steel (that's 40 per cent of our annual production) was used to replace corroded equipment and products, estimates the National Association of Corrosion Engineers.

The petroleum industry spent about $273 million to protect its equipment; railroads paid $500 million; the U. S. Navy spent $100 million, and farmers shelled out $300 million to replace rusting equipment. Three million passenger cars were scrapped, most of them rusted beyond economic repair.

Direct Loss—This year, our corrosion bill will come to $6 billion, says Dr. H. H. Uhlig, head of the corrosion laboratory at Massachusetts Institute of Technology.

That will be the cost of protecting and replacing equipment and products. The higher, indirect losses from shutdowns, overdesign, loss of product, and efficiency are impossible to calculate.

What Can Be Done?—The picture isn't quite as black as it appears. Metallurgists and corrosion engineers are coming up with ways to cut the corrosion rate, and in some instances, to practically eliminate it.

Most of the new developments are in four areas: 1. Cathodic protection. 2. Protective coatings. 3. Corrosion inhibitors. 4. Corrosion resistant materials.

Cathodic Protection

This is the one method known for preventing corrosion or for reducing it virtually to zero. It is widely used to protect underground and underwater pipes and tanks (see diagram, Page 69).

The surface of a corroding pipe or tank is like many small batteries; parts of the surface function like anodes and corrode, while other parts acting as cathodes remain unaffected. Current flows from anode to cathode through the electrolyte (soil or water). Small particles of metal are carried away by the current from the anodic areas. It has been estimated that a current of 1 ampere will carry away 20 lb of metal in a year.

Current Is Reversed—Cathodic protection systems reverse the flow of current, making the protected metal cathodic in the circuit. The two most widely used methods of doing this are: 1. Use of sacrificial metals such as zinc or magnesium, which are sufficiently anodic to steel, to serve as the source of current. 2. Use of a graphite or carbon anode with voltage impressed from an external source.

The second system is preferred by many corrosion engineers because: 1. More accurate control of current flow in the circuit is possible. You can measure soil resistivity and adjust current for variations in different localities. 2. It is possible to detect electrolytic changes in the soil as an increase or decrease of current flow and rebalance the circuit at any time. 3. Less maintenance is required. Nonmetallic anodes do not have to be replaced as often as do sacrificial ones.

Cathodic protection systems can be applied to bare or coated pipes, tanks, and other underground structures. Most often, this protection is used in conjunction with

Inhibitors

Dissolved in corrosive liquids or added to paints as pigments, they stifle the anodic or cathodic reaction.

Resistant Materials

Metals, such as titanium and zirconium which resist a variety of corrosive media, can often be justified despite their high cost.

This field offers American industry one of its biggest cost cutting possibilities. Trimming 1 per cent off the annual corrosion bill could save $60 million

coatings on the outside of the metal and coatings and/or inhibitors inside. (Coatings will be covered in Part II of this article to appear in the Sept. 2 issue.)

Inhibitors

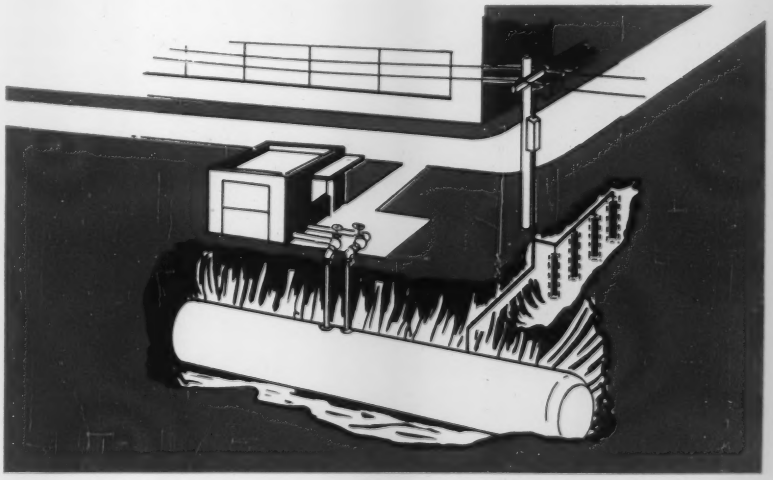
One way to protect metal from corroding while in storage or during shipment is to coat it with grease. This does an effective job, but it involves a cleaning operation before the part can be processed or put in use.

Another way to do the job is with volatile corrosion inhibitors. These materials are used to line wrapping papers, bags, shrouds, and envelopes, and are available in powder and tablet form, and in spray bombs.

Some of the items packaged in volatile corrosion inhibitor wrap are auto spare parts, ordnance parts, guns, machine tools, engines, wire, bearings, hydraulic pumps, sheet steel, and instruments.

Chromate Inhibitors—The chromates and bichromates have successfully inhibited corrosion in cooling towers, air conditioning equipment, refrigerating brines, water cooled engines, boilers, hot water heaters, gas and oil wells, and pipelines. Unlike other corrosion protection means, which try to make the metal resist its environment, the soluble inhibitors make the corrosive solution noncorrosive and simultaneously deposit a protective film.

Zinc chromate is the inhibiting agent in practically all commercial priming paints. Lead chromate and red lead also are extensively used in paints. Chromic acid and bichromate dips are used frequently to passivate metal surfaces before painting. Aluminum is chromic-acid anodized for corrosion protection and to provide an



CATHODIC PROTECTION—External corrosion of underground tanks can be virtually eliminated. In this installation, one ground bed of carbon anodes protects the tank and connecting piping

What Is Corrosion?

Rust is only one of its visible products. Corrosion can occur on the surface or internally between the grains. It often is broken down into four types: Chemical, galvanic, intergranular, and stress cracking.

CHEMICAL—During chemical attack, the base material combines with some element of the attacking chemical and deposits a corrosion product.

GALVANIC—This occurs when two dissimilar metals are joined in a conductive solution. The galvanic cell formed is like a battery—one metal forms the negative pole (cathode) and the other the positive pole (anode). The electrochemical action causes the anodic material to dissolve.

INTERGRANULAR—When the conditions in a metal set up a galvanic cell at the grain boundaries, intergranular corrosion results. It proceeds along the grain boundaries to weaken the metal.

STRESS CRACKING—This type of cracking occurs when a metal is under mechanical or residual stress in a corrosive environment.

adherent base for the zinc chromate primer.

British corrosion engineers are working on a bactericide that can be mixed with the soil to kill sulfate reducing bacteria. It seems to provide good corrosion protection in dense soils where oxygen content is low.

Technetium—Newest and best inhibitor so far is the element technetium (No. 43 in the Periodic Chart). The element does not exist free in nature; it is a by-product of uranium fission. One mole of uranium will produce about 0.06 mole of technetium, but to inhibit corrosion you need only 0.001 per cent technetium by weight. It is effective up to 482° F and has a half-life of 2 million years.

The Atomic Energy Commission is constructing a Multicurie Fission Products Pilot Plant at Oak Ridge, Tenn., to help meet demands for radioactive fission products. The plant should be ready for full production by late fall. Technetium-99 is one of the products.

Resistant Materials

The highly corrosion resistant metals are also highly priced. About the only way their cost can be justified in civilian uses is in those corrosive applications where long life is a necessity.

Titanium is finding greater use in industry, particularly in handling chemical solutions. Example: A premium ferrous metal, a premium nonferrous metal, and titanium were used to make a shaft for a pump that would handle ferric chloride. Both premium metals failed in 45 minutes. The titanium shaft showed no sign of

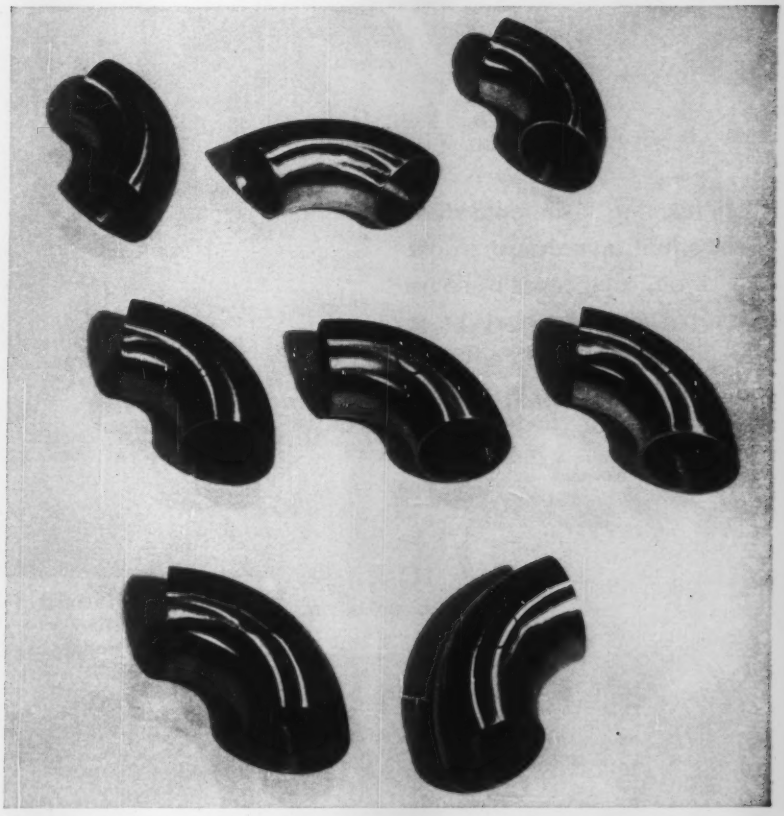
VOLATILE CORROSION INHIBITORS—A steel and wire company uses a VPI wrap, made by Ludlow Papers Inc., Needham Heights, Mass., to protect hose reinforcing wire during shipment

corrosion after two months in use.

Zirconium—Zirconium isn't recommended for handling hydrofluoric acid and shows poor resistance to aqua regia, but aside from those, it has excellent resistance to all corrosive media.

It is used in nuclear power reactors as a cladding on uranium to protect the fuel from the coolant. The chemical industry has found that commercial grade zirconium (it contains 2 to 2.5 per cent hafnium) is useful in many applications. Examples: A waste heat exchanger condensing hydrochloric acid vapors using strong alkalines as coolants; a reaction tank that could be used alternately in hydrochloric or oxidizing mineral acid service and for reactions involving strong alkalines or caustics; valves, filter presses, mixing equipment, and pumps that can be interchanged for service in strong acids or strong alkalies.

Nonmetals — Plastic ventilating ducts and exhaust hoods are finding greater use in applications requiring resistance to acid fumes, such as pickling and electroplating tanks. The material usually is a polyester resin, reinforced with glass fiber that can be shaped or molded to desired size.



ZIRCONIUM—Designed for nuclear energy use, these zirconium welding fittings were forged by Tube Turns, a division of National Cylinder Gas Co., Louisville. They have 1½-in. OD and 0.065-in. walls

VOLATILE CORROSION INHIBITORS—Timken Roller Bearing Co., Canton, Ohio, wraps highly finished mill bearings in VCI wrap, made by Daubert Chemical Co., Chicago, for protection during export shipment

The polyvinyl chloride pipes, fittings, and valves will handle most chemicals up to 150° F and are only one-sixth as heavy as steel. They can be threaded, cemented, or welded into complex systems to handle liquids or gases.

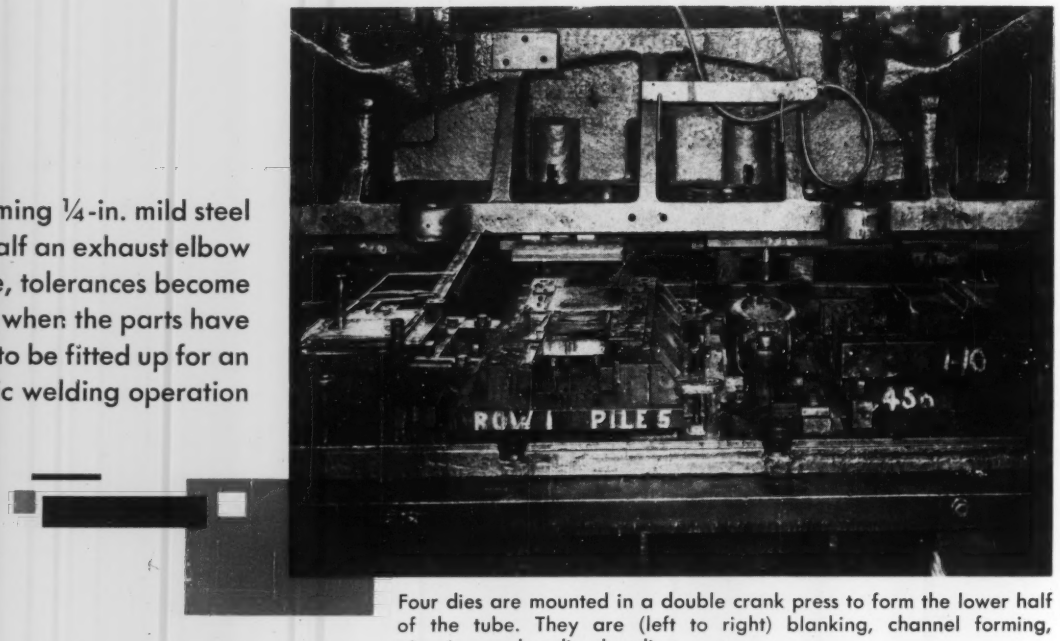
Carbon — In some applications, like chemical pumps, it's hard to beat graphite. The material is unaffected by all corrosives, except a few strong oxidizing agents, and is immune to the effects of thermal shock.

One line of chemical pumps uses graphite for all parts that come in contact with corrosives. In one application, the pumps are used to convey both cold and hot muriatic acid.

Part II of this article, to appear in the Sept. 2 issue, will cover new developments in coatings.

• *An extra copy of this article and Part II which will appear next week are available until supply is exhausted. Write Editorial Service,* STEEL, *Penton Bldg., Cleveland 13, O.*

In forming ¼-in. mild steel into half an exhaust elbow tube, tolerances become critical when the parts have to be fitted up for an automatic welding operation



Four dies are mounted in a double crank press to form the lower half of the tube. They are (left to right) blanking, channel forming, trimming and radius bending

Stamping Plates to Close Tolerances

These two stampings will be welded to form an exhaust elbow tube for a diesel locomotive engine

TOLERANCES of 1/32-in. on ¼-in. thick mild steel stampings are not particularly tight unless you are forming parts like those pictured above.

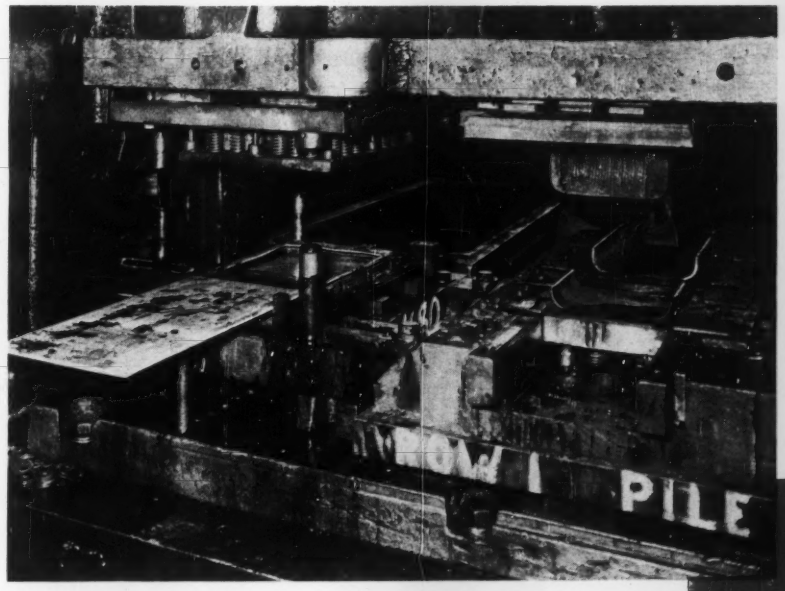
The open stampings have to be overformed to compensate for springback. Forces on the die are unbalanced and tend to shove the part off-center.

The two stampings will be welded to make an exhaust elbow tube for a locomotive diesel. A 16-cylinder engine has 32 of these elbows.

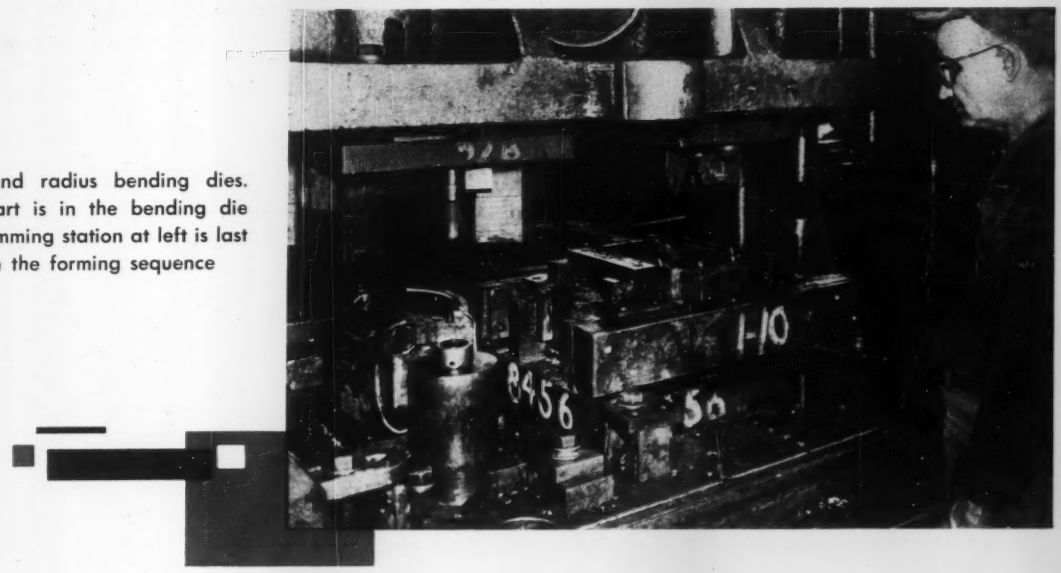
Why the Tolerances?—The weld opening between the upper and lower halves of the tube is critical. The elbow is welded in an automatic machine. If the opening is too wide, the weld metal will not bridge the opening, and the weld will burn through. If it is too narrow, the metal will not penetrate the joint properly and will build up on top of the elbow.

Another reason for the tolerances is the fit of the part. The square end of the tubular elbow is welded into an oblong hole in the engine block, and the curved end is welded to the cylindrical manifold.

Stamping the Parts—Commercial Shearing & Stamping Co., Youngstown, built four dies for each part and mounted them on a 500-ton Toledo double crank press. A part is blanked, channel formed, radius bent and sides are trimmed. The detail of the blank design and accuracy of the blanking dies eliminate the need for trimming the ends.



Blanking and channel forming stations. Plate at left has just been blanked; at right, blank has been stamped into a channel



Trimming and radius bending dies. Stamped part is in the bending die at right. Trimming station at left is last operation in the forming sequence

Pieces are moved from die to die by hand. Each time the press ram comes down, a completed part is removed from the press. Production is 150 to 200 pieces an hour.

History of Part—Originally, the exhaust elbow tube was stamped out and trimmed by torch in another plant. Tolerances that were necessary to production weld the part couldn't be held. The company was getting a lot of bad welds.

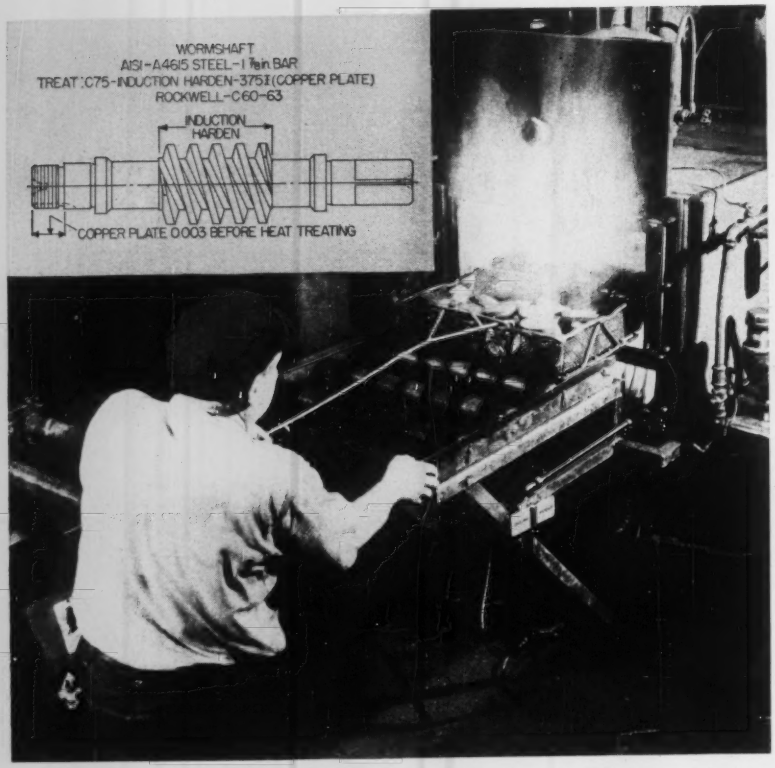
Later, the part was made from forged seamless tubing, bent and trimmed. Even with the elimination of welding, the method was too expensive.

Then the job went to Commercial. Engineers developed dies which would stamp parts to the tolerances established by the welding conditions.

Cost Comparison—The hot rolled tubing from which forged tubes were made costs 15 cents a pound. The sheet from which Commercial stamps the elbow is 6 cents a pound. Forging also required more pounds of the material.

John R. Nelson, plant engineer at Commercial, estimates the cost of the stamped part is less than half that of the forged version.

• *An extra copy of this article is available until supply is exhausted. Write Editorial Service,* STEEL, *Penton Bldg., Cleveland 13, O.*



These turret lathe parts have been hardened to the specifications coded on the blueprints. Inset shows a typical blueprint with specifications for heat treating

Coding Heat Treating Data

Complex card systems are eliminated by use of a simple coding system that gives heat treating specifications on blueprints. Simplified system minimizes the risk of error

THE INCLUSION of heat treating directions on blueprints has helped to minimize improper heat treatment at Warner & Swasey Co., Cleveland.

"The coding system specifies heating media, temperatures and quenching media. It can be extended to involved processes requiring several steps," says Robert Hook, chief metallurgist.

Heating Media—The first symbol indicates heating medium. Carburizing is indicated by A through G, with each letter specifying a definite depth:

A	0.005-0.010 in.
B	0.015-0.025 in.
C	0.025-0.035 in.
D	0.040-0.050 in.
E	0.050-0.060 in.
F	0.060-0.070 in.
G	0.070-0.080 in.

Other letters used as heating media designations:

S	Salt
L	Lead
P	Cyaniding

When no letter precedes a temperature symbol, the use of atmosphere furnaces is assumed.

Temperatures—Temperatures in the 1000-1999° F range are expressed by the two middle figures. The first and last figures are understood to be 1 and 0.

Exact numbers are used to express temperatures up to and including 999° F and 2000° F plus.

The designation C75 means carburizing to a depth of 0.025-0.035 in. at 1750° F.

Quenching — Standard media have these temperature ranges:

A	Air at 60-80° F
Y	Water at 60-80° F
Z	Oil at 100-150° F
L	Lead

If the quenching symbol is omitted entirely, it is A, or air.

Carburizing to a depth of 0.040-0.050 in. at 850° F, followed by a normal quench in water, would be given by D850Y.

Special Heat Treatment—A local heat treating process is shown by putting the complete treatment symbol in parentheses. The area for the localized hardening, or cyaniding, is indicated on the drawing as a dimensional length.

Tempering is denoted by a temperature symbol following the quenching symbol. Temperatures are coded as previously explained.

After temperature, the time interval is signified by horizontal lines through the Roman numeral I.

Ī-ONE HOUR Ī̄-TWO HOURS

Example—To obtain the maximum core and case properties of 4615 steel, it should be carburized and double quenched. The depth required is 0.025-0.035 in. The code would be:

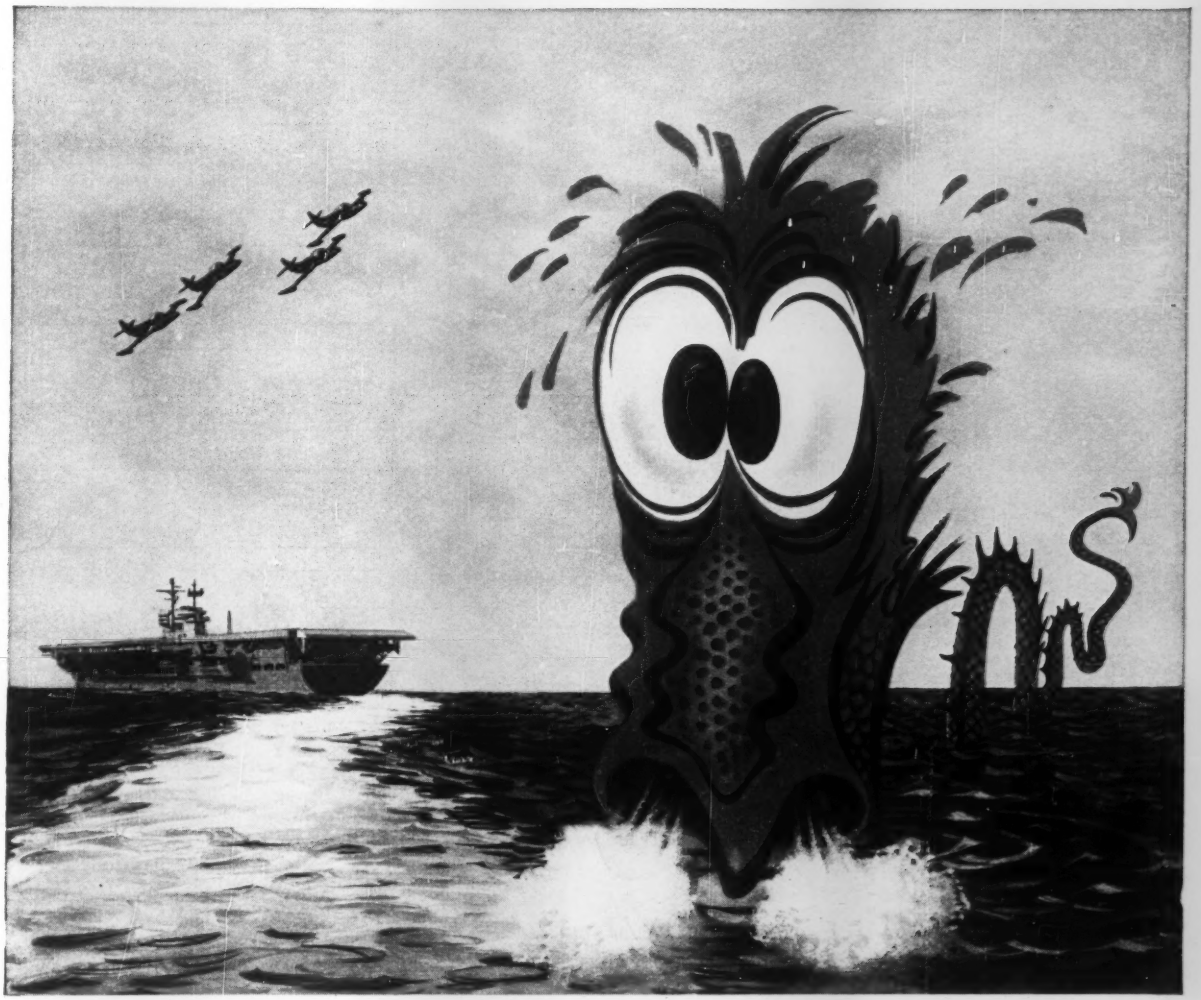
C75-57Z-42Z-375 Ī̄

This indicates that the part is to be carburized at 1750° F, cooled down to room temperature in air, followed by a reheat to 1570° F, an oil quench, then a 1420° F reheat and another oil quench, followed by tempering at 375° F for 1 hour.

Use—This system expedites work through the heat treating department. It eliminates the use of a large master card system and reduces the amount of supervision and clerical effort required.

Revisions and changes can be made easily.

PERMOBOND COVERINGS



The Case of the Frustrated Sea Monster

Put steel propeller shafts in contact with bronze bearings. Then add salt water and you create a *monster*.

The three have combined to produce an electrolytic action which pits the steel shaft, weakening it and inviting breakage under the severe stresses involved in the radical maneuvering of fighting ships.

In such great new super-carriers as the "Forrestal" and "Saratoga" (as in their predecessor of decades ago, the first "Lexington") this "monster" of electrolysis can't exist. Propeller shafts are covered with U. S. Permobond®, the rubber lining that defies electrolytic attack and corrosion.

Permobond Covering and Linings can be applied to any metal section, large or small, simple or complex. When unit is too large to ship, our field crew will install and vulcanize Permobond right in your own plant, or install Permobond as original equipment in the fabricator's plant. Where special conditions occur, a wide range of synthetic Permobond lining stocks is available.

If there's a monster on sea or land, corroding your operations, get in touch with any of the 28 "U. S." District Sales Offices or write us at Rockefeller Center, New York 20, N. Y.

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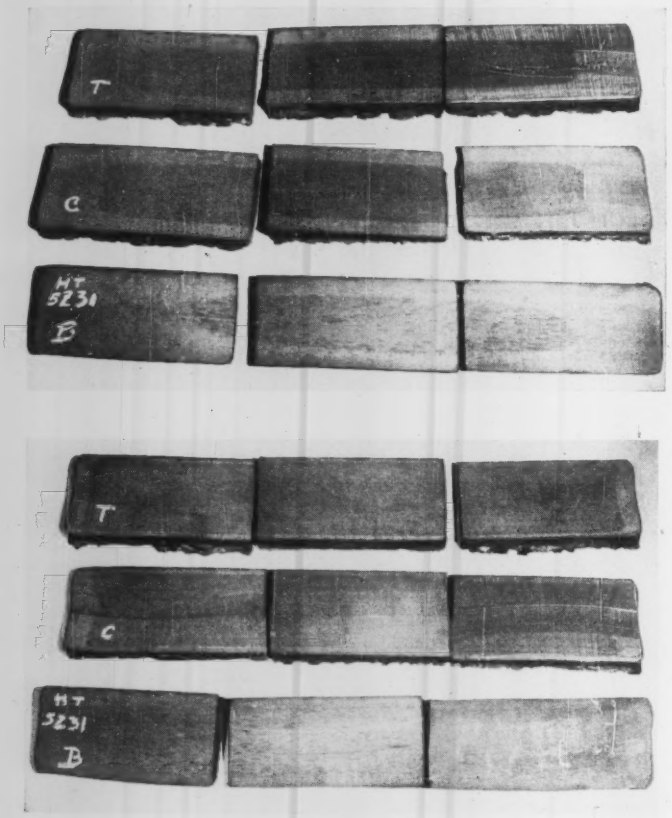
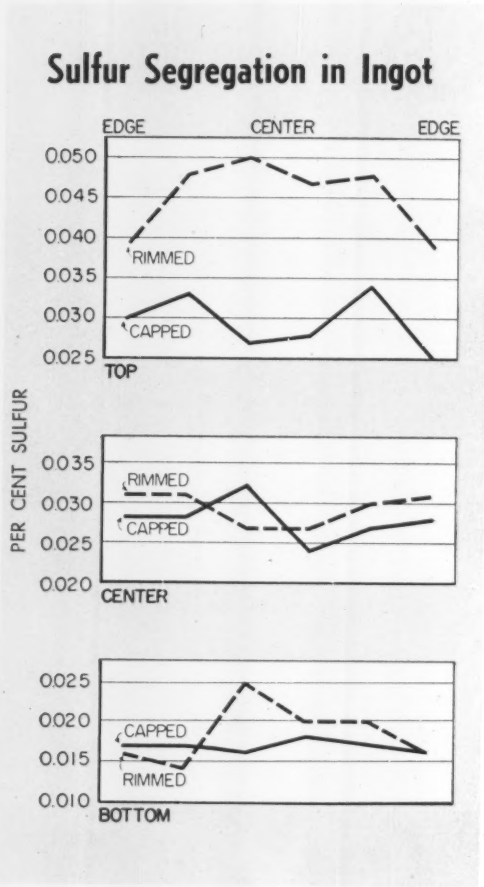




How sulfur segregation compares in rimmed (top) and chemically capped ingots (bottom). Ingots are from the same heat, poured side by side in the mold string. Ladle sulfur was 0.024 per cent

Chemical Capping Cuts Drawing Rejects

After pouring more than 2 million tons of chemically capped steel, Ford feels that the procedure solves many more deep drawing problems than it creates

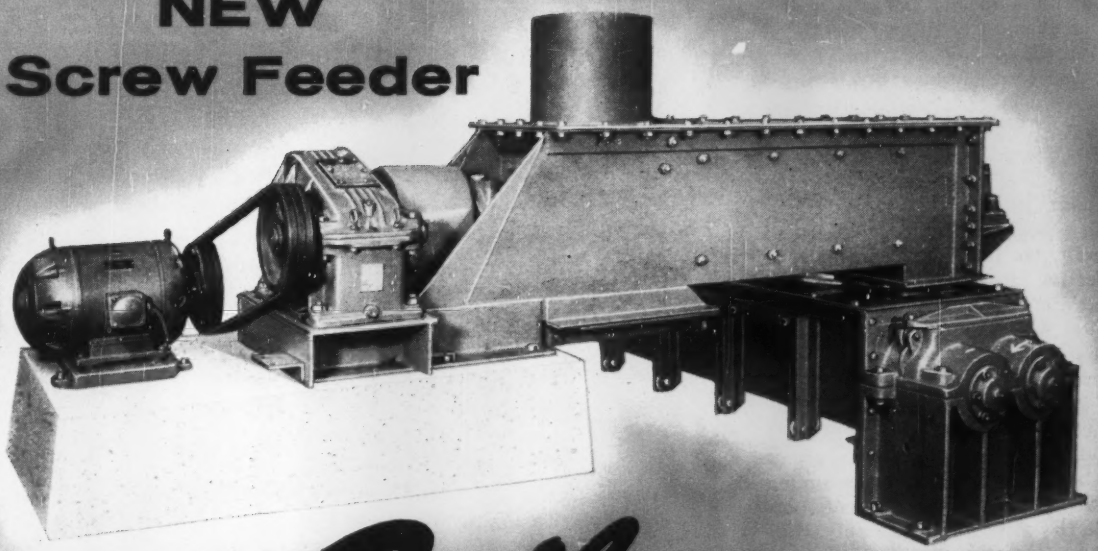
By JOHN S. McNAIRN
Quality Control
Steel Div.
Ford Motor Co.
Dearborn, Mich.

IN THE COURSE of supplying deep drawing steels to Ford, we found we were getting too many complaints and rejections on difficult draws. The major cause of dissatisfaction was breakage that resulted from nonuniform chemistry in our rimming ingots. Excessive top cut segregation prevented the development of good physical properties.

A possible solution might have been to use top cut slabs for less demanding jobs, but this would not always be practicable. Instead, we began experimenting with chemically capped (controlled rimming) ingots to minimize this segregation.

Scrap Goes Down—Toward the end of 1954 we began to get high rejections on one of our difficult applications—an oil pan draw. The problem resulted from poor physical properties associated with top

NEW Screw Feeder



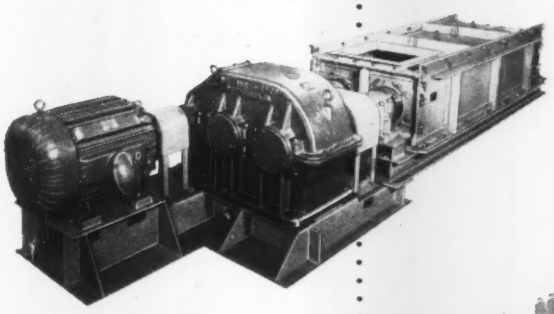
MAKES *Bailey* PUG MILLS

EVEN MORE EFFECTIVE IN SINTERING PLANT AND BLAST FURNACE DUST CATCHER SERVICE

The new Bailey Screw Feeder is effective for flow regulation and conveying of flue dust, ore fines and various other materials. An outstanding feature is that it maintains uniform flow, even when irregular feeding may be caused by "hanging" of material in dust catcher or a sudden furnace "slip." The feeder speeds the sintering process and assures substantial savings through reduced handling costs.

BAILEY PUG MILLS were developed for low-cost processing of greater tonnages of more uniform sintered products. They are built for continuous service, in capacities from 100 to 400 tons per hour.

Write for Bulletins



This Bailey Double Shaft Pug Mill is equipped with a double helical gear reduction unit. Types of Bailey Pug Mills available include single and double shaft types, with direct or rope drives.

WILLIAM M. *Bailey* COMPANY
ENGINEERS
LEADERSHIP THROUGH QUALITY

1221 BANKSVILLE ROAD PITTSBURGH 16, PA

segregation in the rimming ingot. This seemed to be an excellent opportunity to test the practicability of chemically capped steel.

Our scrap dropped from 7.8 to 1.8 per cent. We have continued to supply on this job, and our rejections for poor physicals are practically nonexistent.

We expanded the use of this type material to other troublesome jobs with good results. As an additional benefit, we had a lowered rate of defective steel both in our mill and in the customers' plants during a period when the demand for tonnage production was taxing our manufacturing facilities.

Full Ingot Use—The chemically capped ingot does not necessarily yield a product that is superior to the bottom portion of a rimming ingot. Where it is economically possible to use bottom slabs only, they will produce a superior sheet steel. But where it is not desirable to divert top slabs (because of product limitations of size and type, or because of inadequate or costly handling facilities), the chemically capped ingot product is definitely superior to the full product of a rimming ingot.

We have found some limitations necessary on the substitution of chemically capped for rimming steel. The technique has its maximum advantage when used in low carbon ranges below a ten ladle carbon. In heats above ten carbon, the results are erratic. In many cases, segregation and piping are much worse than would be the case with a normal rimming steel of comparable analysis, particularly as the carbon approaches the 1020 range. This is probably associated with the decreased tendency to rim.

Rim Needed—We have found a good rimming heat to be a prerequisite to chemical capping. One of the important factors in the manufacture of chemically capped steel is the use of fluorides in the mold to promote rimming. Another is control of rimming time—3 minutes is desirable as an average. But this would vary to some extent with mold size, rate of rise in the mold and the general rimming characteristics of the heat. Heats which blubber or bleed excessively should be diverted to some less demanding application.

A properly capped ingot will show a slight rise or dome on top. Our practice provides us with a rim after scarfing of ¼ to ½-in. thickness in a slab 4½-in. thick. This rim survives all soaking pit and reheat furnace operations and gives a good cold-rolled finish free of surface lamination.

Finishing Practice—In mill processing a chemically capped steel, no deviation from standard practice has been found to be necessary. Ford hot strip mill finishing temperatures are above the critical temperature, with coiling temperatures between 1200 and 1250°F. Reduction from hot band to cold-rolled coil averages 60 per cent. Annealing temperatures of 1290 to 1320° F at soaks of up to 24 hours produce consistently good results.

This would apply to Ford's processing facilities only. But any practice that produces good rimmed steel should be capable of producing a chemically capped steel of good quality.

Physicals—No tendency toward nonaging has been observed in aluminum capped steels with normal equiaxed grain. It is doubtful if sufficient consistency could be obtained in manufacture to assure a pancake grain with good ductility and nonaging properties. Occasional coils have had these characteristics, and research with mill finishing temperatures and percentage reductions is underway.

A slight increase in average Rockwell "B" hardness may result from chemically capping the ingot. It is not pronounced, and it has not adversely affected the formability of the product. Elimination of segregation variables and the resulting breakage provide an advantage that more than compensates for the slight increase in average hardness.

The Case for Capped Steel

The Steel Co. of Canada Ltd., Hamilton, Ont., has been pouring capped steels (both mechanically and chemically capped) for many years. Here's what Ralph D. Hindson, assistant chief metallurgist with that company, says about capping:

"To us, a capped steel is one in which the cap is applied within 2 minutes after pouring. We make capped steels (whether bottle top, mechanical or chemical) for moderate draws, uniform physicals and chemistry across sheets, good surfaces for tin plate, slit coils and to solve earing problems. We use the mechanical cap for low carbon, more active rimming steels; and the chemical cap for higher carbon (up to 0.30 C and 1.10 Mn), poorer rimming steels.

"The lower half of the rimmed ingot is just the same as capped steel. Ferrostatic pressure in pouring is so great you actually are capping the lower half of the rimmed ingot.

"Capped steel has a tremendous advantage over rimmed steel for uniformity of chemistry, but you can't apply capped steel indiscriminately for rimmed steel, especially if the customer is going to do open flame welding. The capping merely arrests—holds in suspense—the rimming action. When you heat up the metal as in open flame welding, the rimming action starts, and the steel spits all over the place."

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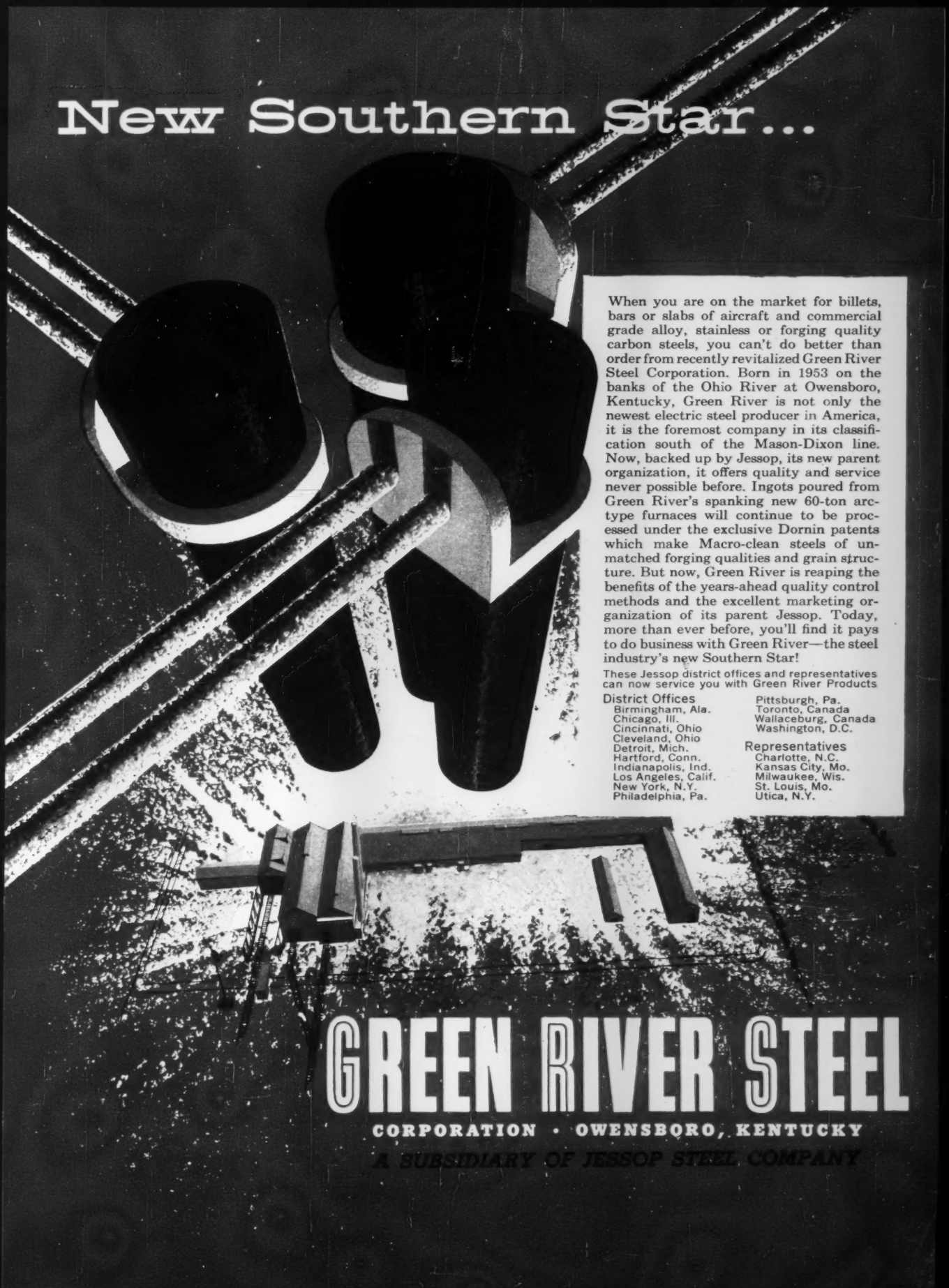
New Southern Star...



When you are on the market for billets, bars or slabs of aircraft and commercial grade alloy, stainless or forging quality carbon steels, you can't do better than order from recently revitalized Green River Steel Corporation. Born in 1953 on the banks of the Ohio River at Owensboro, Kentucky, Green River is not only the newest electric steel producer in America, it is the foremost company in its classification south of the Mason-Dixon line. Now, backed up by Jessop, its new parent organization, it offers quality and service never possible before. Ingots poured from Green River's spanking new 60-ton arc-type furnaces will continue to be processed under the exclusive Dornin patents which make Macro-clean steels of unmatched forging qualities and grain structure. But now, Green River is reaping the benefits of the years-ahead quality control methods and the excellent marketing organization of its parent Jessop. Today, more than ever before, you'll find it pays to do business with Green River—the steel industry's new Southern Star!

These Jessop district offices and representatives can now service you with Green River Products

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Indianapolis, Ind.
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Pittsburgh, Pa.
Toronto, Canada
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Finishes Clutch Cones

A surface grinder and automatic fixtures on the worktable cut costs for partmaker

THE part in the illustration below is a clutch cone for an automatic transmission (automotive). It's being finished on an automatic surface grinder made by Mattison Machine Works, Rockford, Ill.

Except for manual loading and unloading, all operations are built into the surface grinder. When the part is positioned, a clamp holds it against a notch in the inner ring of the worktable.

Safety—An electric switch on the grinding wheel shuts off the machine if a part is positioned incorrectly. It's a safety feature that saves the equipment from damage by an inattentive operator.

FORK

. . . unloads cones from grinder

Each pass through the machine removes between 0.010 and 0.015 in. of stock on one side of the part. Automatic sizing is provided by both roughing and finishing wheels. Additional limit switch protection is built in. As soon as the useful limit of a grinding wheel is reached, it turns off the automatic sizer and flashes a red light.

Work is unloaded automatically after it has passed under the finishing head. A cam releases the clamp holding the part and a fork beneath the fixture tilts the fixture. Parts slide into an exit chute. The fixtures are simple and are said to require exceptionally little maintenance.

Tracer Lathe Cuts Jet Discs

Turbine discs are mounted in the center of the machine—both faces are cut at once . . . Government will tout automation at Swedish show . . . Giant camera will aid template making

NEED to machine any large, thin discs? If so you can take a tip from some aircraft engine producers who have to machine jet engine turbine wheels.

To fight a critical distortion problem, some of them are swinging to center-drive lathes that machine both sides of the wheels at the same time. A machine just delivered by Wickes Machine Tool Co., Saginaw, Mich., is a case in point.

Tracered — The workpiece is chucked in the center of the machine. Two cutters move simultaneously across the part faces, each guided by a two-dimensional GE electronic tracer control. Since each cutter is guided individually, there need be no similarity between contours on the two faces.

The machine is expected to hold tolerances of ± 0.0005 with normal speeds of 100 to 250 sfpm.

Each tracer controls two drives. They are synchronized to keep the cutting tools directly opposite one another. This helps minimize distortion of the wheels due to tool pressure.

Plugging Automation

When the government goes abroad to brag about U. S. industry, the main topic is "automation." At least that will be the case at the big St. Erik's Fair in Stockholm, Sweden, that opens next week.

The theme of the American exhibit will be "Automation at Work." A Department of Commerce spokesman says: "We will present a picture of automation and its implications for man, to show that the United States is working not only to produce more goods but to provide a better way of life for its citizens and to help raise the standard of man's existence throughout the world."

This is evidence of Washington's realization that automation is no man-idling monster. It may mean that future soapboxers will find fewer government ears tuned in when they cite automation as a threat to labor.

Fourth Quarter?

Many machine tool builders continue to talk about better business in the fall. E. C. Bullard, chairman, Bullard Co., Bridgeport, Conn., says he expects an "upturn in the demand for our products in the latter part of this year if the national economy continues its upward trend."

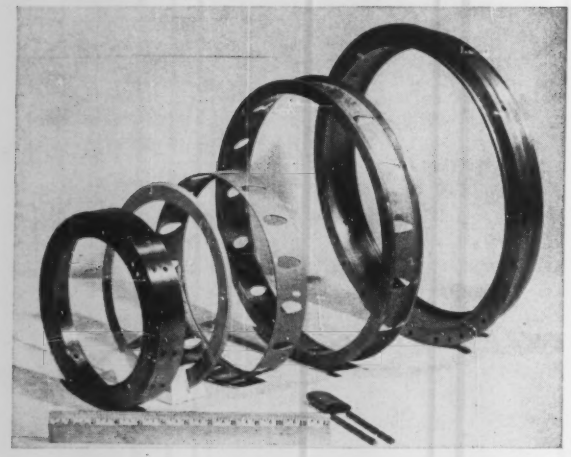
Mr. Bullard says his company was hit with cancellations when the Air Force staged its cutback, but he adds, "Requests for quotations on our machine tools continue at fairly high levels; our market and customer surveys show that substantial requirements for machine tools still exist on present production."

Templates on Film

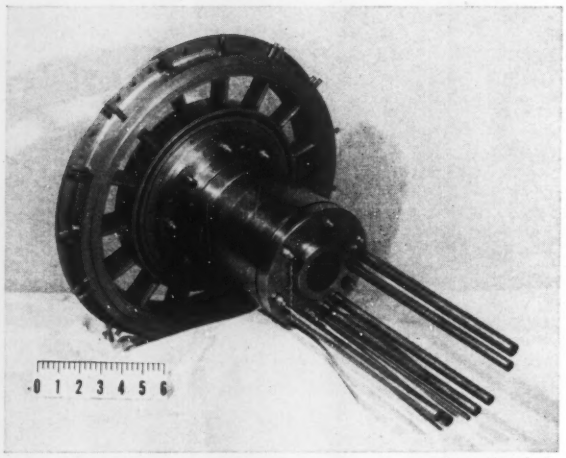
Convair, San Diego, has just taken delivery on a giant camera that will act as a shortcut in template preparation for the 880 jet airliner. Built to Convair specs by Robertson Photo-Mechanix Inc., Chicago, the camera weighs more than 10,000 lb. It's 30 ft long, 8¾ ft high and 7 ft wide. It will reproduce templates up to 5 x 12 ft, and hold 0.002-in. tolerances.

Standard practice has been to make a drawing on large sheets of metal and then machine around the drawing. Now, the surface of the metal will be sensitized, and the camera will project the drawing-board image on the sheet.

A. E. Hill, works manager, points out that the new process not only will save time, it will virtually eliminate errors made in transferring the pattern from drawing board to metal copy.



Turbine after bearing support. Components for the shroud ring are at left. Air cooled sheet metal struts are brazed to outer and inner Type 502 chromized shroud rings. After assembly, the spoke pairs are brazed to the massive outer and inner flanges which are machined from low alloy forgings



Solar Aircraft Co.

Brazing for High Temperature Use

Many critical assemblies for jet engines are being brazed with nickel-base alloys in dry hydrogen atmospheres. Safe service temperature for such parts is about 2000°F

By G. S. HOPPIN III
Flight Propulsion Laboratory Dept.
General Electric Co.
Evendale, Ohio

NICKEL-BASE alloys have made brazing a feasible method of fabricating assemblies used at extreme high temperatures.

The alloys have good high temperature properties; assemblies brazed with them have a safe service temperature of 2000°F. Applications include many critical high temperature parts for automotive, aircraft and atomic energy equipment.

Alloys—Three classes of alloys are generally used: 1. Nickel-chromium-silicon-boron. 2. Nickel-silicon-boron. 3. Nickel-chromium-silicon.

The first and second are derivatives of hard-facing alloys. Class 1 includes alloys first developed for brazing and are covered by AMS specifications 4775A and 4776. Class 3 alloys were originally developed for nuclear reactor applications in which boron could not be tolerated because of its high neutron capture cross section.

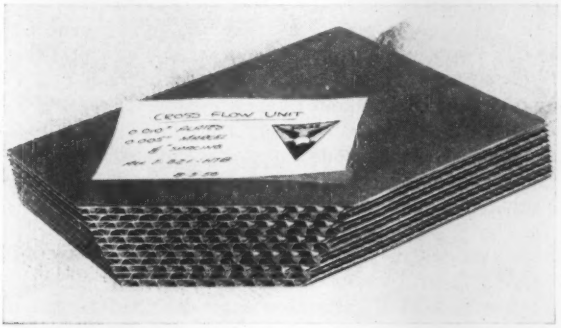
Brazing is done in furnaces with purified (dry) hydrogen atmospheres of at least −60°F dew point at temperatures of 2000 to 2200°F. The alloys conventionally are supplied as −100 mesh powders but also are available as plastic bonded wire, sheets and tape, or as cast rods for metal spraying.

Applications—The jet engine industry has found many applications for these alloys, and many more are to come. Most uses have been in relatively low stressed parts, such as guide vanes, fuel nozzles and temperature probes. Promising uses are in rotating parts cooled by air and in major engine structures made of honeycomb sandwiches.

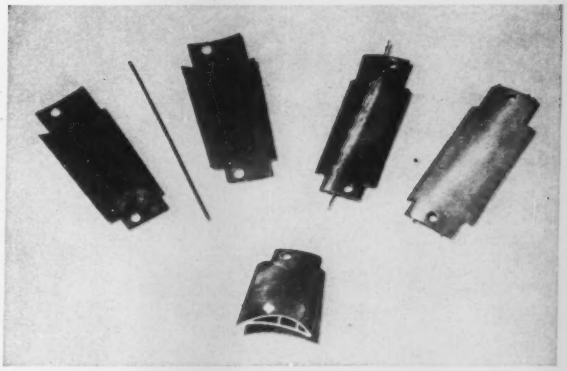
The sandwich structure is particularly promising because it offers considerable weight savings due to its high rigidity to weight ratio. Airframe manufacturers have been using it for some years as an adhesive bonded product. The development of high temperature brazing materials and know-how was necessary to make these structures practical for the extreme temperatures characteristic of jet engines.

Extremes—A paper given at the

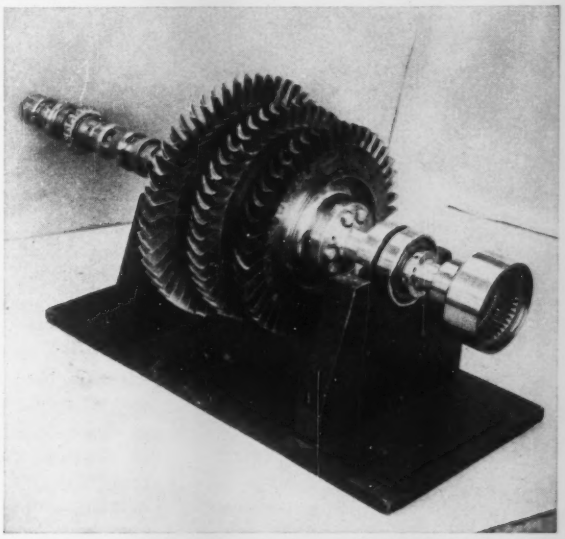
Compressor Stator Ring—AISI 410 roll-formed blades are assembled by staking to the Type 321 shroud rings. Small lugs are spotwelded. Furnace brazing produces a precision assembly within 0.005 in. flatness and concentricity



Combustor Heat Exchanger—High heat transfer coefficients are obtained in this crossflow type heat exchanger by brazing corrugated 0.005 in. Type 321 foil to separating plates of 0.010 in. Type 321. Inconel or stainless clad copper sheets could be used



Compressor Stator Blade—Two-piece shell is Timken 17-22A steel. Brazing with a nickel-base alloy, which has a flow point of 1850°F, makes it possible to braze and austenitize simultaneously



All photos: Solar Aircraft Co.

Turbine Blading—This three-stage, water-cooled turbine rotor uses 149 blades. Brazing is used to join and seal the tip caps, side plugs and coolant tubes of the blades. Blades are investment cast from chromium-molybdenum-vanadium alloy. Brazing is done after a diffused chromium coating has been applied

SAE National Aeronautic meeting in Los Angeles (authors: John V. Long, George D. Cremer and Richard S. Mueller of Solar Aircraft Co., San Diego, Calif.) included a photo of a typical turbojet engine whose gas temperatures ranged from about −80°F at the air inlet zone to 3000-3500°F at the afterburner and tail pipe.

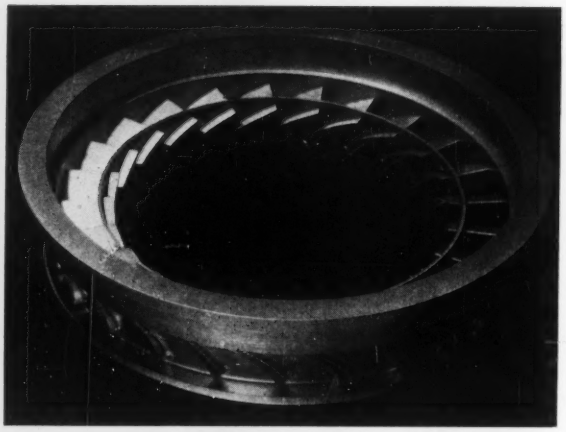
Brazed assemblies are being used at both extremes and between. The photos on these pages show a few of the critical parts joined by brazing. Some have been proved in service; others still are experimental.

Problems—It has been necessary to solve a number of peculiar metallurgical problems to produce good quality parts brazed with the nickel bearing alloys.

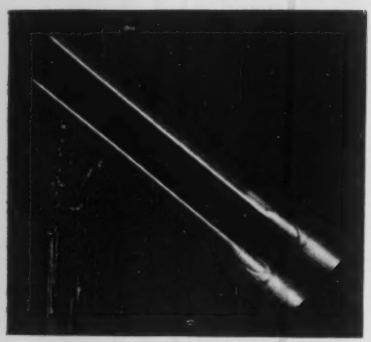
Four key problems in applications of the process were: 1. Dissolving of the base materials by the brazing alloys (erosion). 2. Brittleness of the joints produced. 3. Adverse effects on parent metals caused by the brazing process. 4. Atmosphere purity requirements of the process. Exceptionally close process control has been required to circumvent the problems.

Diffusion—A characteristic of high temperature brazing alloys is that they diffuse into and alloy with stainless steel and superalloys rapidly. Their good strength at elevated temperatures is largely

Afterburner Shrouds—These all-metal honeycomb sections serve as self-supporting air ducts and also provide a thermal barrier. Core of the shroud is 0.002 in. Type 321 foil in ⅜-in. cells, 3/16-in. high. Facing material also is Type 321 foil, 0.002 in. thick. The part being held weighs 6 lb. Type 321 honeycomb shrouds operate up to about 1300°F. Inconel shrouds maintain integrity at 1700°F. Short time operation up to 2000°F is feasible



Turbine Nozzle Diaphragm—Twenty-four prebrazed turning vanes are fusion tackwelded between a heavy outer flange and a 0.067 in. inner shroud ring. This assembly is integrated during a second brazing operation. A corrugated sheet metal insert is brazed in each vane. Cooling air forced over and through this corrugation keeps the low alloy steel vanes at acceptable temperature. Both corrugation and vane were chromized before brazing



All photos: Solar Aircraft Co.

Afterburner Fuel Spray Bars—These 12 in. nozzles consist of flattened N-155 tubes brazed to heavy Type 321 base sleeves. A scarf joint design is used to avoid concentration of stress and premature fatigue failure

due to this behavior.

The same behavior also gives rise to a critical problem when brazing thin sheet materials. In a test, one-half gram of AMS 4775 powder was placed on ⅝-in. square panels of 0.005 in. thick L-605 cobalt base alloy. After 5 minutes at 2150°F, the brazing alloy had completely penetrated the sheet; after 10 minutes, it had eaten a large hole through it; after 20 minutes, the L-605 was completely dissolved.

Erosion—A study of the nickel-base alloys showed that boron was primarily responsible for erosion.

Nickel - chromium - silicon alloys have been standardized on by the Aircraft Gas Turbine Div. of General Electric Co. for brazing thin sheet materials. They are not free of erosion characteristics but are markedly superior to the boron-bearing materials. To minimize erosion with all the high temperature alloys, minimum times (5 to 15 minutes) must be used at brazing temperature. A satisfactory solution to erosion was mandatory for the successful development of honeycomb sandwich brazed structures which use foil as thin as 0.002 in. in the core.

Brittleness — This problem is a consequence of the high hardness of eutectic constituents present in the nickel alloys. Good design practice can do much to eliminate brittleness by avoiding high stress concentrations in brazed joints. It cannot always be done, and a search for ductility improving heat treatments has been made.

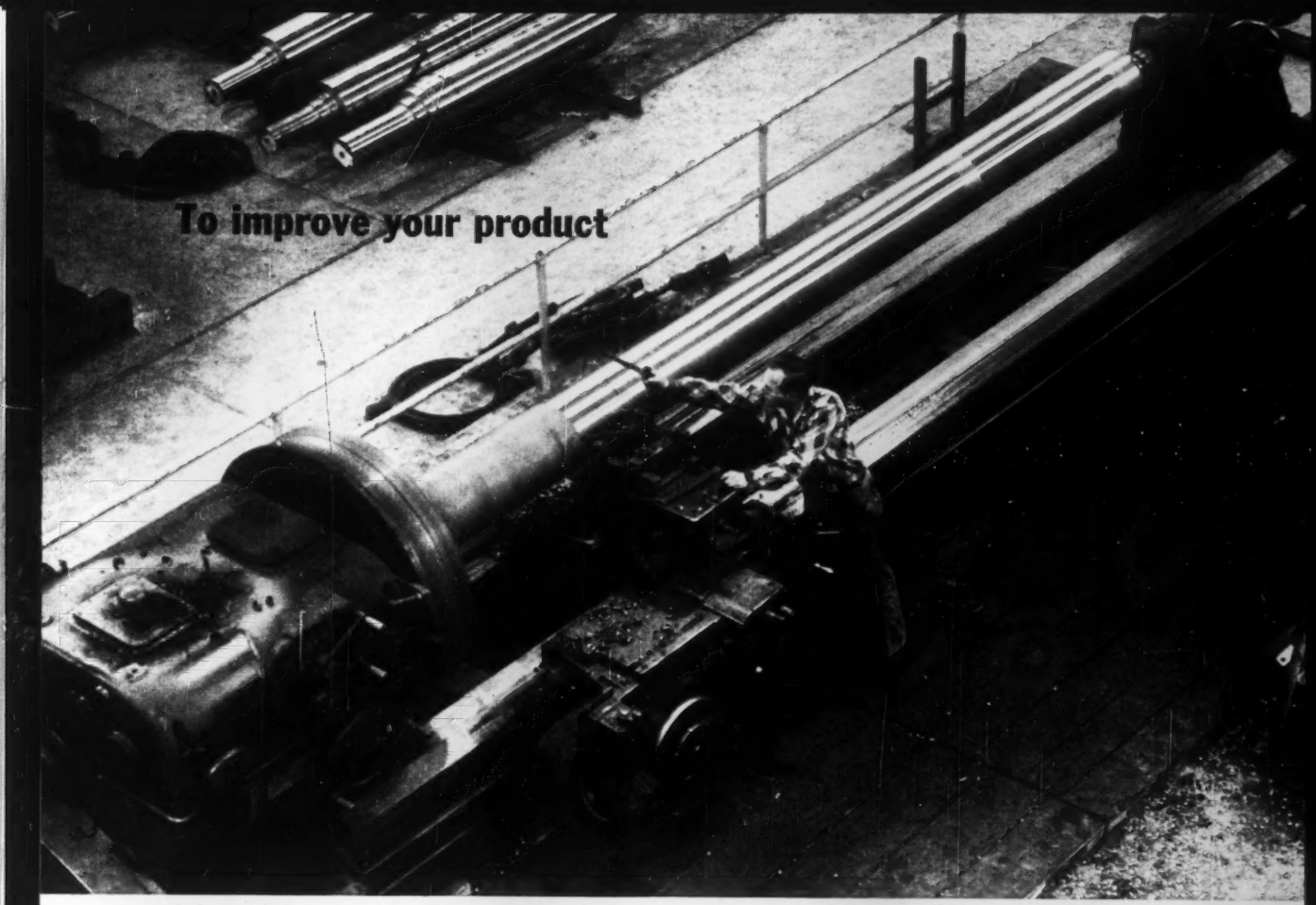
Rather good success has been had with postbrazing high temperature anneals 200 to 300°F below brazing temperature. The anneals promote diffusion of the brittle eutectic constituents out of the joint and into the parent material. In Inconel brazing with a nickel-chromium-silicon alloy at 2200°F, a 10-hour heat treatment at 2000°F completely eliminated the eutectic constituents and caused recrystallization of the Inconel across the original joint.

Parent Metal—When a brazed high temperature part will be highly stressed in service, particular attention must be paid to the effects of the brazing thermal cycle.

Adverse effects on high-alloy parent material include embrittlement, loss of yield strength and the solution of intermetallic compounds in age-hardening alloys.

Failure—An experimental jet engine part made of Inconel failed prematurely during testing. Tensile tests of Inconel bars subjected to the same brazing cycle revealed that the normal annealed yield strength of 47,000 psi had dropped to 22,000 psi.

Microscopic examination correlated the yield strength drop with extreme grain growth caused by the brazing cycle. Another investigation revealed that some other high temperature materials withstood the same brazing cycle with only a 15 to 18 per cent loss in yield



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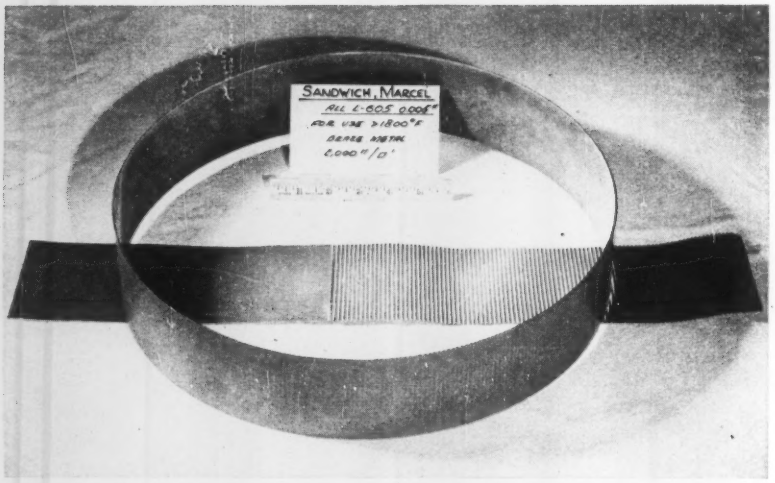
Control Unit—This assembly is subjected to 900°F bleed gas. Ten brazed joints are required to make the part. Basic housing is Type 347 investment castings. Needle valve seat, bosses, cover plate and tubing are brazed



Afterburner Liner—Superalloy L-605 (Haynes Alloy 25) has been brazed into an air-cooled corrugated type sandwich. Core is 0.005 in. foil in ⅛-in. corrugations. Facings also are 0.005 in. thick. These assemblies are feasible for service temperatures up to at least 2200°F

strength. Tests to determine the effects of brazing cycles on materials should be made during the development of parts which are to be highly stressed in service.

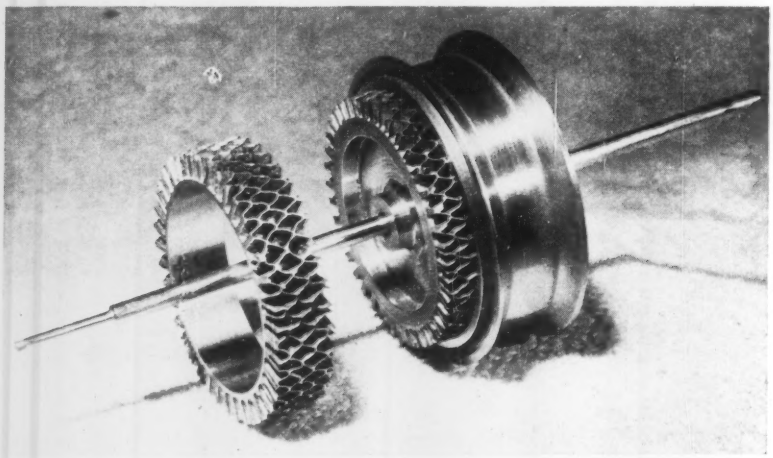
Protection — Atmosphere purity requirements are much more stringent than those in copper or silver brazing. This is because no flux is used, and the hydrogen atmosphere must reduce such refractory oxides as that of chromium.

Adequate protection for brazing stainless steels and some superalloys requires a maximum influent dew point of −60°F (−80°F is a common commercial dew point).

Superalloys—Many of the age-hardening superalloys contain titanium and aluminum. The atmospheres suitable for brazing stainless steels are not satisfactory for those materials because of the difficulty of reducing titanium and aluminum oxides.

A popular high temperature material in the titanium-bearing category is A-286. In brazing it, and similar alloys, the titanium problem is evaded by plating the surfaces to be brazed with nickel and isolating the titanium from the surface.

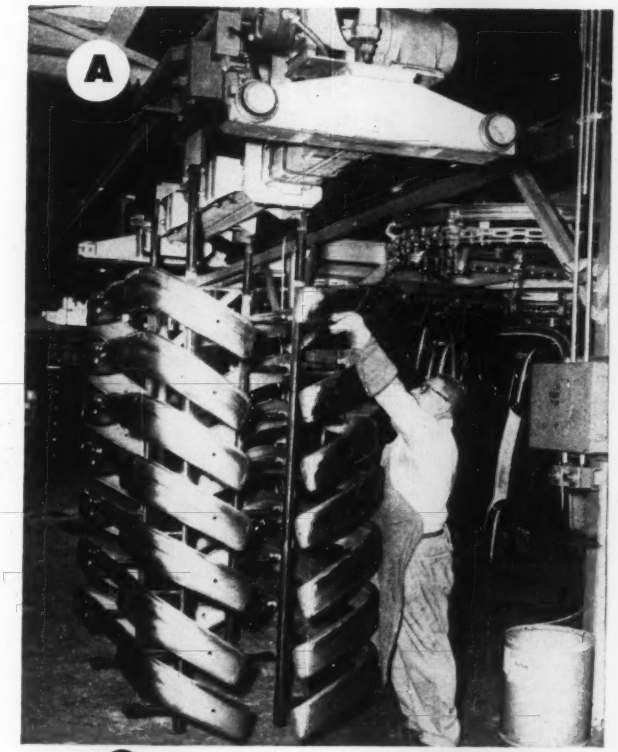
Another way of avoiding the refractory oxide problem is to eliminate the atmosphere entirely and braze in a high vacuum. The lack of suitable vacuum furnace equipment has prevented this from becoming common practice, but the next few years should see vacuum brazing of elevated temperature materials attain commercial significance.



Piston Element—This low leakage, low friction sliding seal design for pneumatic actuators is under study. A core of 0.004 in. thick Inconel foil with ⅛-in. cells has been brazed to a backing ring which in turn was shrunk into a piston and rod assembly. Lapping of the open-face structure within a cylindrical bore provides a close fitting combination

Summary—Brazing with nickel-base alloys is a highly attractive method of fabricating jet engine components and other high temperature equipment. It presents some unique metallurgical problems which must be understood for correct application, but by using close process control, high strength parts of highly alloyed, high temperature materials can be produced.

• *An extra copy of this article is available until supply is exhausted. Write Editorial Service,* STEEL, *Penton Bldg., Cleveland 13, O.*



AMERICAN MONORAIL

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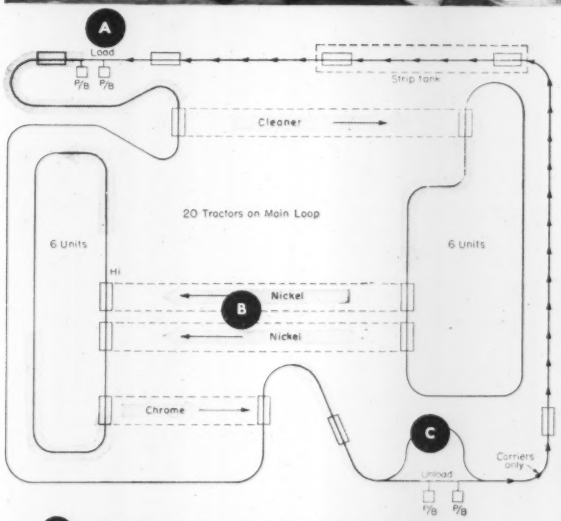
plates auto bumpers at Rheem Automotive plant

Combined engineering skills resulted in substantially reduced handling costs for the plating of auto bumpers at the new Rheem Automotive plant at Fullerton, California.

32 American MonoRail automatic dispatch units move special Udylite bumper carriers on three monorail systems with 14 drop sections to maintain continuous automatic plating.

Let American MonoRail engineers combine to solve your handling problems.

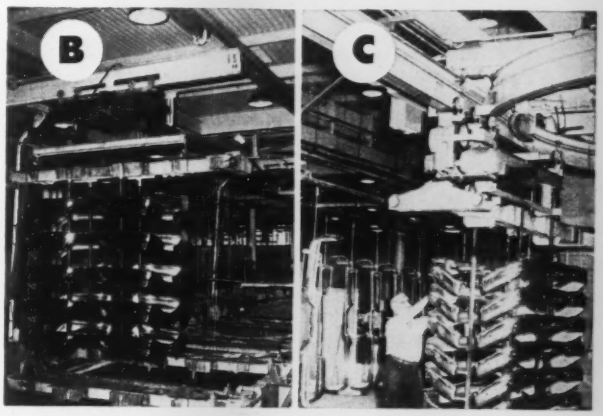
Write for Bulletin C-1.



A — Loading station where bumpers enter system.

B — Bumpers move through nickel tanks.

C — Inspection and unloading station.



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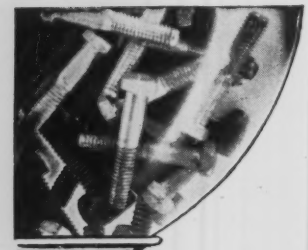

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Tests Plating

Hardness testing the chrome plated insides of cylinders is easier with this instrument

TESTING the microhardness of chrome plated interior surfaces is now practical, claims the Wilson Mechanical Instrument Div., American Chain & Cable Co. Inc., New York.

The firm's new Type MO Tukon has been adapted to that use by Alco Products Inc., Schenectady, N. Y.

MEASURING
. . . hardness inside cylinder

Application — Chrome plating improves surface resistance to wear, corrosion and metal fatigue. Correct determination of the hardness of chrome plated interior surfaces of castings has been difficult.

G. R. Griffith, manager of general engineering and testing at the Schenectady firm, says: "We could not determine effectively the hardness of the chrome plated interiors of our castings prior to perfecting this application. It was comparatively simple to determine the hardness of the outside surfaces where no wear and tear were involved."

The tester is mechanically operated. Load is applied under dashpot control and can be regulated to apply the load at speeds down to 0.04 in. per minute. Loads of 1 to 1000 grams can be applied.

Portable Tester Measures Thickness from One Side

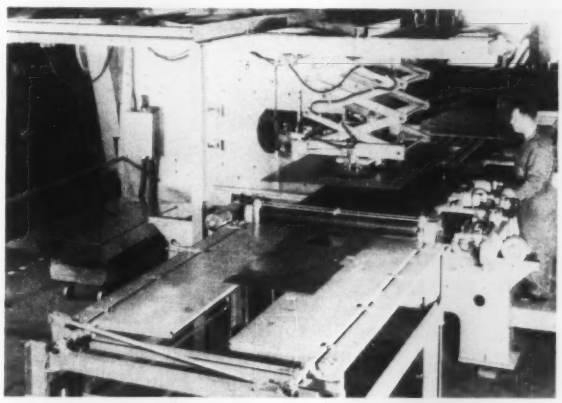
The Sonizon SO-200 can locate areas of corrosion or wear on storage tanks, pipes, ship hulls, airplane wing skins, drier rolls, and other structures which can be reached from only one side.

In manufacturing, the ultrasonic unit is used to measure thicknesses and detect laminations and the lack of bond between materials.

The operator selects the proper crystal range, places the probe on the test area, and rotates a dial until harmonic lines match a pattern of flashing lights. The dial gives the thickness reading.

Materials can be measured with an accuracy of ±3 per cent on thicknesses between 0.027 and 4 in. *Write*: Magnaflux Corp., 7300 W. Lawrence Ave., Chicago 31, Ill. *Phone*: Underhill 7-8000

Automatic Loader and Stacker Reduces Handling Time



Large metal sheets or plates, up to 48 x 84 in. and 400 lb, are picked up by a pair of 14-in. vacuum cups operated by an automatically controlled vacuum pump on this machine.

The loader is designed to be used with turret punch presses equipped with a direct measuring table and gage, but other sizes are suited for use with shears and other fabricating equipment.

The workpiece is automatically brought to the front of the press and placed on the table.

While the press is operating, the loading unit returns to the stack, picks up the next piece, and hovers in readiness above the table.

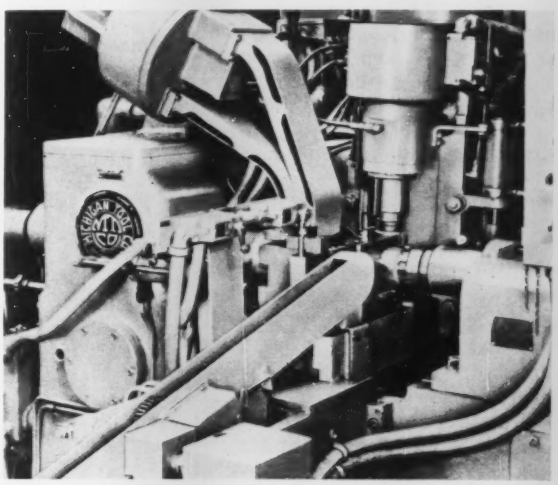
Loading and unloading take 20 seconds per part. *Write*: Wiedemann Machine Co., 665 Wissahickon Ave., Philadelphia 32, Pa. *Phone*: Baldwin 3-2850

Part Feeder Speeds Hobbing Production

Output of a single spindle hobber can almost be doubled by this part feeder. It takes parts—gears with extended hubs and similar parts which tend to support each other when mounted in pair on an arbor—and orients them so that they can be mounted back-to-back on an arbor. The unit can also load other types of machine tools.

Two parts at a time enter a drum-type alternator. A swinging arm rotates one of the parts 180 degrees. (Before, all parts were aligned the same way.) Each part then slides down a track. The tracks merge at the input end of the machine feed slide, and the parts drop into a slot in proper position to be shuttled to the arbor of the machine.

It takes 4 seconds to load two gears. Hob life for a given production run is extended by back-to-back hobbing as the hob enters the cut only once. *Write*: Michigan Tool Co., 7171 E. McNichols Rd., Detroit 12, Mich. *Phone*: Twinbrook 1-3111



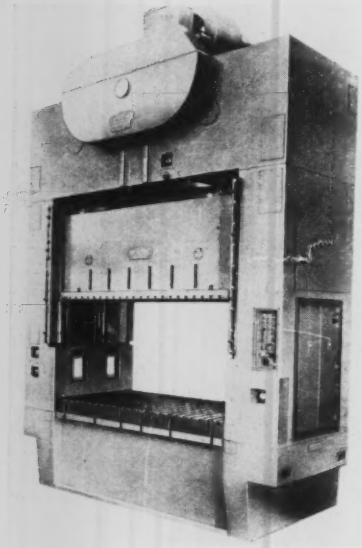
NEW PRODUCTS and equipment

500-Ton Press

This four-point eccentric press produces a wide variety of automotive stampings.

The press has a 24-in. stroke and an adjustment of 15 in. The shut height is 61½ in. Both bed and slide have areas of 72 x 144 in.

All gears and the drive mechanism are enclosed. The die area is illuminated from both sides by lights recessed in the uprights.



An auxiliary air brake is used to stop the flywheel. All gears are spray lubricated.

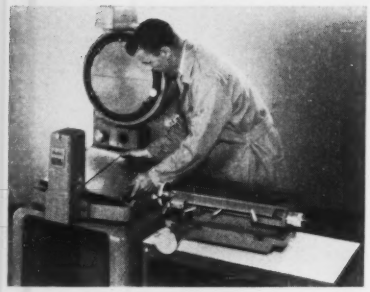
The pneumatic cushions in the bed have separate operating controls to permit a greater variety of press operations. *Write*: Cleveland Punch & Shear Works Co., 3917 St. Clair Ave., Cleveland 14, Ohio. *Phone*: Henderson 1-1911

Contour Projector

Kodak Model 14-6 has an interchangeable table system. A flat staging table is used for production line optical gaging, and a movable worktable is used for horizontal toolroom measurements.

A flat 13 x 19⅝ in. is used. Working distance is 8 in. for all magnifications.

Replacing the staging table with a movable worktable converts the unit to toolroom work. Horizontal



measurements can be made to 0.0002 in. The slotted worktable is 8 x 19¼ in. *Write*: Optical Gaging Products Inc., 26 Forbes St., Rochester 11, N. Y. *Phone*: Genesee 8-8974

Tool Control

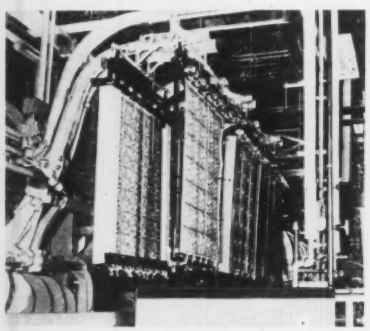
TorqueTrol applies automation to control of tool feed. It also detects jamming, tool wear, faulty lubrication, etc., and stops the machine, or sounds an alarm.

When connected to a recorder, the unit registers the length of time the tool has been used and when it idled. Connected to a counter, it registers the number of parts produced.

Operation: Any abnormal condition in the machine operation increases the torque and load on the motorshaft. This increases the power used by the motor. The control monitors the electric power, detects the increase, and stops the machine instantly. *Write*: Electronic Control Corp., 1573 E. Forest Ave., Detroit 7, Mich. *Phone*: Temple 2-6625

Circuit Plating

The automatic processing machine in this production line is designed for copper plating circuits. Over 5 million circuit boards can be produced annually.



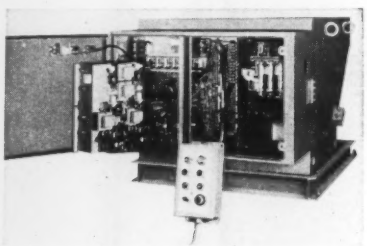
The plating tank is 75 ft long. Each arm holds two racks. Each rack holds 24 plastic boards in position for the electrolytic deposition of the copper wire pattern.

Holes and eyelets are plated through to form a mechanical bond to circuits on both sides of the base. *Write*: Frederic B. Stevens Inc., 1800 18th St., Detroit 16, Mich. *Phone*: Tashmoo 5-0725

Positioner Control

This circumferential weld positioner control, EF-7871, is used with automatic fusion welding machines.

The table is rotated by a direct-current motor geared directly to the table. An electrically operated clutch-brake stops and starts the table. Maximum speed can be reached in three cycles. The speed can be regulated to 2.5 per cent at 60 rpm of the motor shaft and 0.5 per cent at 1800 rpm.



Acceleration takes place in 60 milliseconds. Response time is 30 milliseconds. *Write*: Weltronic Co., 19500 W. Eight Mile Rd., Detroit 19, Mich. *Phone*: Kenwood 2-2800

Control Panel Checking

The Circuit Sleuth System troubleshoots the complicated electrical control panels on special machine tools.

The system consists of terminal strips in the control panel to which all internal components are wired, and special pilot lights in the machine control panel.

After a machine stops, the maintenance electrician can spot the machine location and operation where trouble exists by checking lights extinguished on the panel.

Each terminal strip is numbered in accordance with a wiring diagram supplied in a handy reduced size. The over-all circuit is checked with a bell or light set. Then a

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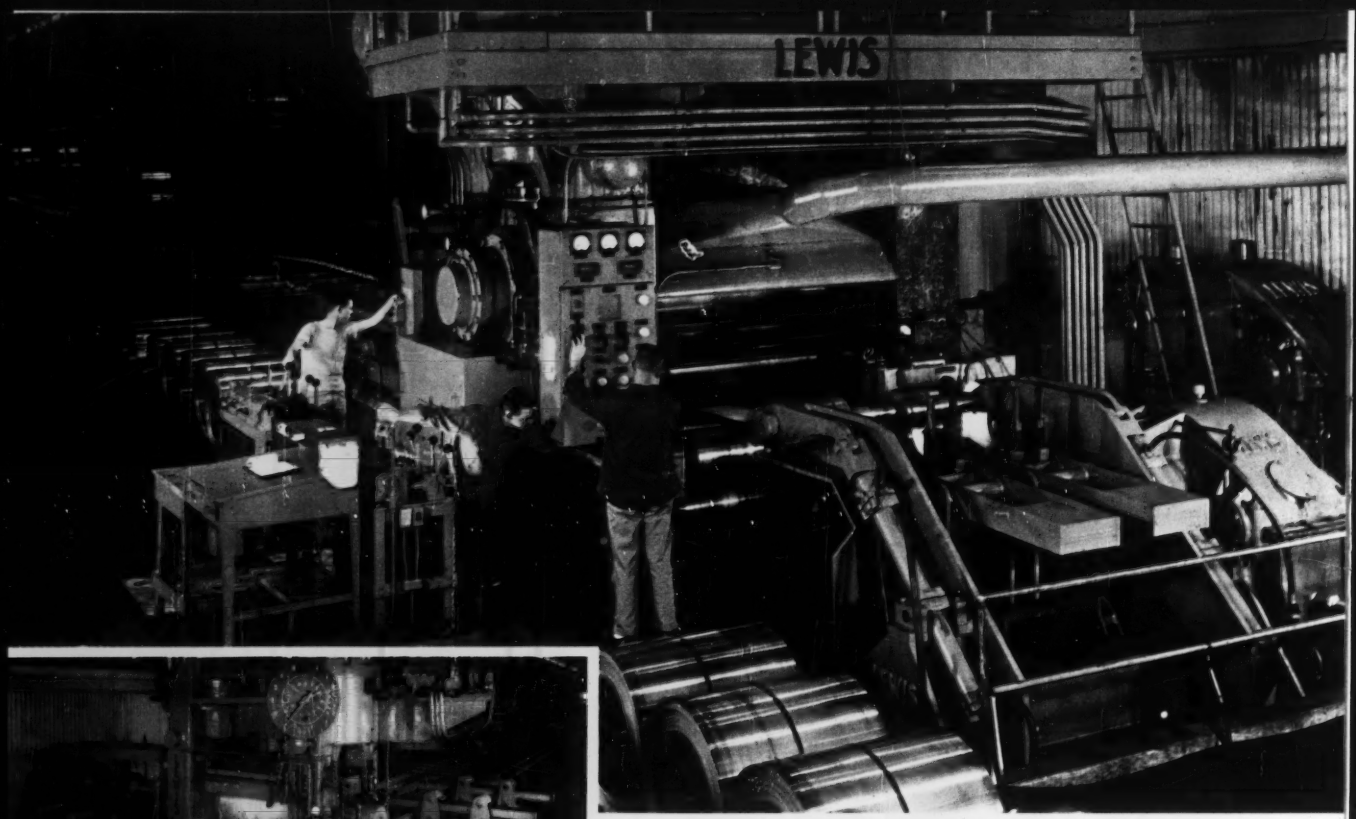
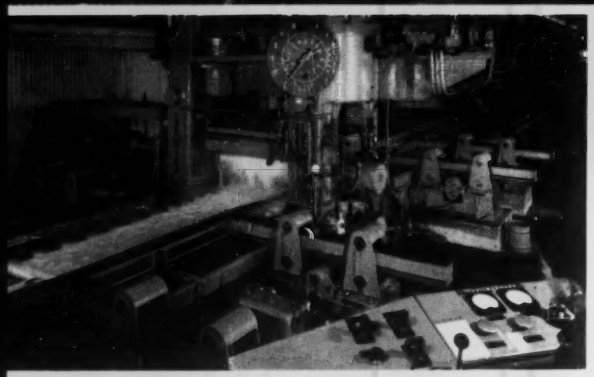
Blaw-Knox Building · 300 Sixth Avenue
Pittsburgh 22, Pennsylvania



15 and 36 x 69-inch 4 high mill at Aluminum Foils, Inc., Jackson, Tennessee, for reducing aluminum strip to foil thicknesses. Dual coolant system permits use of mill for both hot and cold rolling.



30 x 70-inch 2 high hot reversing mill at Aluminum Foils, Inc., Jackson, Tennessee, reduces 10-inch, 3000 lb. aluminum ingots to finished strip 0.250 inch thick x 60 inch maximum width.

BLAW-KNOX ALUMINUM REDUCTION MILLS

Blaw-Knox designs and builds a full range of mills for the reduction of Aluminum and other non-ferrous metals. Other Blaw-Knox equipment for the metals industry includes complete rolling mill installations including all auxiliary equipment for ferrous and non-ferrous metals, iron, alloy iron and steel rolls, Medart cold finishing equipment, carbon and alloy steel castings, fabricated steel plate or cast-weld design weldments, steel plant equipment, and heat and corrosion resisting alloy castings.

BLAW-KNOX

BLAW-KNOX COMPANY

Foundry and Mill Machinery Division
Blaw-Knox Building . 300 Sixth Avenue
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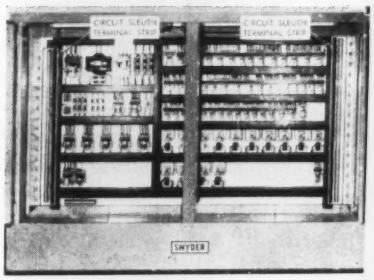
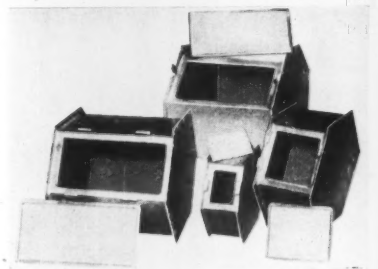


detail check of each electrical component in the system is made by checking numbered terminals.

The terminal strips can be altered to suit panel design changes. *Write*: Snyder Tool & Engineering Co., 3400 E. Lafayette Ave., Detroit 7, Mich. *Phone*: Lorain 7-0123

Tumbling Barrels

Inspection is easier with these barrels. They are lined with an orange colored vinyl plastic.

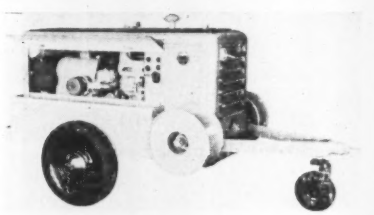


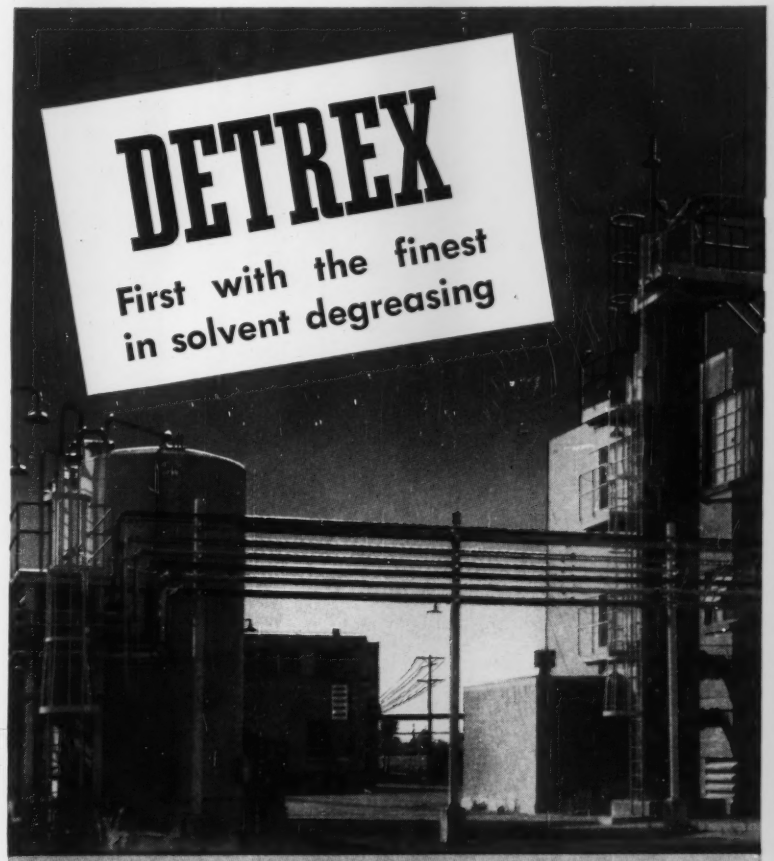
The lining has no seams and is resistant to wear and abrasion, oils, and most chemicals. *Write*: Rampe Mfg. Co., 14915 Woodworth Ave., Cleveland 10, Ohio. *Phone*: Mulberry 1-2800

Rotary Compressor

The Hydrovane Rotary 125 is a multistage compressor with a single free-floating rotor. The rotor is positioned so that it is constantly concentric with one side only of the stator.

Segmented blades are inserted





NEW PERM-A-CLOR®

sets new standards for solvent stability

New DETREX PERM-A-CLOR* trichlorethylene degreasing solvent - stabilized to a new high degree - has been proven on the toughest of metal cleaning jobs.

New PERM-A-CLOR* - premium grade in every respect - excels in EVERY phase of solvent degreasing. It readily dissolves oils, greases, fats and waxes, yet will not attact any industrial metal or alloy. It is safe to use and easy to control. It distills like a pure chemical compound. And most important, its high stability assures longer solvent life and the substantial savings that result.

DETREX, pioneer in all phases of metal cleaning and processing, uses its experience and facilities to bring increased efficiency to any degreasing, washing or coating operation. Write today for detailed information on the wide range of DETREX machines, materials and services. There is a perfect combination to meet your requirements.

*Perm-A-Clor is the registered trademark of DETREX Chemical Industries, Inc.

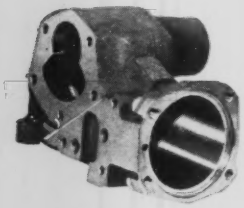
DETREX CHEMICAL INDUSTRIES, INC.

BOX 501, DETROIT 32, MICHIGAN

Why MICROHONING

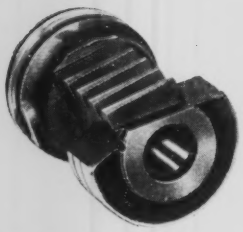
Is Final Stock Removal Process For Interrupted and Blind-End Bores

To secure low-cost, final stock removal, that generates accuracy and functional surface characteristics in a variety of bore conditions, a leading manufacturer of power steering assemblies uses Microhoning. Here are details concerning types of bores and stock removal results obtained by using Micromatic "Know How"—



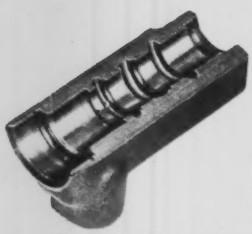
STEERING GEAR HOUSING—Microhoning consistently corrects cumulative inaccuracies of preceding operations—reduces scrap—permits faster boring—cuts boring tool sharpenings—lowers down-time and tool costs.

Material: Soft Malleable Iron
Bore: 3.125"D x 6.93"L (Ported bore with ¼" relief at blind end)
Stock Removal: .002"
Finish: 50 Microinches RMS
Microhoning Cycle: 18 sec.
Preceding Operation: Boring



PISTON RACK—Microhoning answers the need for a final stock removal process that generates a controlled surface finish in the bore of this leaded steel part. Microhoned surface (cross hatch) prevents oil leakage and holds to a minimum the wear of seal that operates in the bore.

Material: Leaded Steel (Rockwell 62 "C")
Bore: .875"D x 3"L
Stock Removal: .005"
Finish: 20 Microinches RMS
Microhoning Cycle: 20 sec.
Preceding Operation: Boring and H.T.



VALVE HOUSING—Microhoning consistently holds size and geometric accuracy—meets stringent surface requirements—assures alignment of four lands in bore. Thus, there is no leakage of oil around control valve which is selectively fitted to its housing.

Material: Cast Iron
Bore: .770"D x 2.18"L (Interrupted)
Stock Removal: .0025"
Tolerances: Size .0005"
Roundness .0001"
Straightness .0001"
Finish: 10 Microinches RMS
Microhoning Cycle: 12 sec.
Preceding Operation: Boring

The principles and application of Microhoning are explained in a 30-minute, 16mm, sound movie, "Progress in Precision" . . . available at your request.

☐ Please send me "Progress in Precision" in time for showing on _____(date).
☐ Please have a Micromatic Field Engineer call.
☐ Please send Microhoning literature and case histories.

NAME _____G
TITLE _____
COMPANY _____
STREET _____
CITY _____ ZONE _____ STATE _____

MICROMATIC HONE CORP.
8100 SCHOOLCRAFT AVENUE · DETROIT 38, MICHIGAN

NEW PRODUCTS and equipment

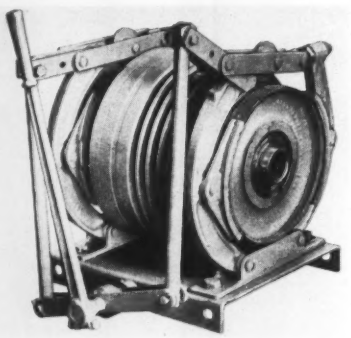
radially in longitudinal slots. They move continuously in a straight line from the stator center and cannot bind.

Volumetric efficiency goes up to 92 per cent. Capacity: 125 cfm. Two-wheel trailer and skid mountings are available. *Write*: Davey Compressor Co., Kent, Ohio. *Phone*: Orchard 3-3471

Reduction Pully

The internal planetary gearing of this speed reduction pulley provides ratios up to 8000:1.

The shaft mounted unit provides two internally reduced speeds. Both may be in the same direction or one may be forward and the other reverse.



Speeds are controlled by two mechanical clutches, mounted on a base and operated by a common lever.

The pulley can be operated horizontally or vertically.

Sizes: 12, 18, 20, and 24 in. diameters with ratings up to 120 hp. *Write*: Hart Reduction Pulley Co., 426 W. Main St., Waukesha, Wis. *Phone*: Liberty 7-4073

Jib Crane

Capacities of the 52 sizes of jib cranes in this line range from 500 to 10,000 lb. Booms are 8 to 20 ft long.

The beam support bearing provides safe load support and requires a minimum of maintenance.

A large tapered roller bearing is at the top of the support column. Below are a pair of steel rollers which bear on a wear band welded

to the column. These rollers are mounted on antifriction bearings and are adjustable.

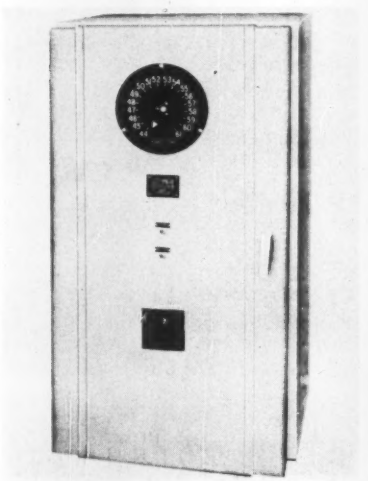
The crane can be leveled quickly without the use of shims. Total beam deflection under full load does not exceed 0.060 in. per foot. *Write*: Becker Crane & Conveyor Co., 4900 Ridge Rd., Cleveland 9, Ohio. *Phone*: Shadyside 9-2733

Motor Controller

Type 2027 is a variable speed controller which closely regulates the speed of conventional alternating current motors over a wide speed range.

Full-rated motor torque is achieved at all speeds without exceeding rated rotor or stator currents.

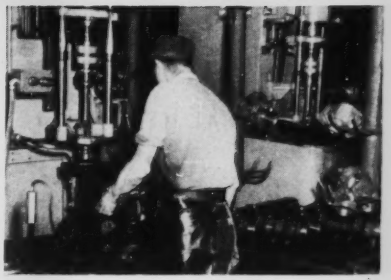
A direct current tachometer generator is used for feedback of motor speed. Regulation of ±1 per cent is obtained over a speed range

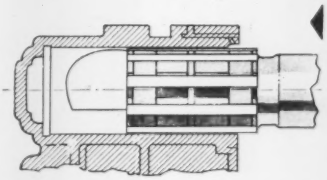


How MICROHONING

Cuts Costs—Generates Accuracy—Speeds Production of Interrupted, Blind-End Bores

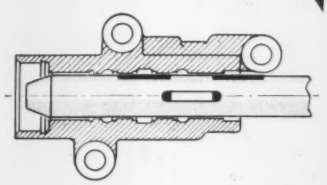
Shown are two Microhoning machines that are used in the plant of a leading manufacturer of automotive power steering assemblies. Machines are equipped with automatic stone feed and stonewear compensating mechanisms, and automatic sizing controls. A two-position rotary fixture is interlocked with machine controls for fully automatic index cycle. The following applications tell more of the "how".





STEERING GEAR HOUSING—In Microhoning the ported, blind-end bore of steering gear housing a nine-stone tool is used. At least six of nine stones are in contact with bore surface when tool passes over irregularly shaped port. Removing .002" of stock from 3.125"D x 6.93"L bore in 18 seconds, Microhoning generates final accuracies and a controlled finish of 50 microinches as specified.

PISTON RACK—In 20 seconds, Microhoning removes .005" of stock from .875"D x 3"L open end leaded steel bore of piston rack. Self-sharpening abrasives assure a consistent generation of specified surface finish of 20 microinches.



VALVE HOUSING—Microhoning tool used for final stock removal in bore of valve housing has one bank of stones and two banks of plastic guides—three stones or guides in each bank. Guides act as tool pilots and stabilizers in interrupted bore—prevent overcutting at edges of lands—assure straight bore by keeping tool aligned. Self-dressing abrasives consistently generate geometric accuracy of .0001" and surface finish of 10 microinches.

Microhoning economically removes stock—corrects cumulative inaccuracies of preceding operations—reduces scrap—permits faster boring—lowers machine tool downtime and maintenance to cut costs and speed production.

Send Coupon for Complete Information

Learn how Microhoning will give efficient stock removal, closer tolerances, accurate alignment and functional surfaces.

☐ Please have a Micromatic Field Engineer call.
☐ Please send Micromatic literature and case histories.

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Practical Idea for the Production Man

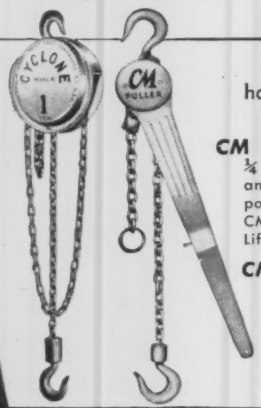
Efficient electric hoists...to move materials overhead and release floor space for more valuable operations.

CM HOISTS

CM LODESTAR ELECTRIC CHAIN HOIST
⅛ to 1 ton capacites—First truly heavy duty version of small electric hoist. ¼ ton model weighs only 51 lbs. Heavy duty self-adjusting brake. Upper-lower safety limit switches. CM-Alloy load chain.

CM METEOR ELECTRIC WIRE ROPE HOIST
½ to 5 ton capacities—Compact, enclosed design. Low headroom. Continuous duty motor with thermal overload protection for heavy duty service. Precision bearings and helical gears for long life. Only 110 volts at push button control.

Good Suggestion for the Maintenance Man!



Rugged lightweight hand hoists and pullers...to make your job easier and safer

CM CYCLONE HAND HOIST
¼ to 10 ton capacities—Easy to carry and lift. One ton model weighs only 36 pounds. Made of tough aluminum alloy. CM-Alloy load chain. High efficiency. Lifetime lubrication.

CM PULLER THE "ONE MAN GANG"
¾ to 6 ton capacities—Lifts or pulls at any angle. Lever handle operation. Automatic load brake holds at any point. ¾ ton model weighs only 13 pounds. CM-Alloy flexible load chain.

ALSO... *CM Trolleys and Cranes*

WRITE OR WIRE FOR COMPLETE CATALOG AND NAME OF YOUR LOCAL DISTRIBUTOR

CM HOISTS AND CHAIN

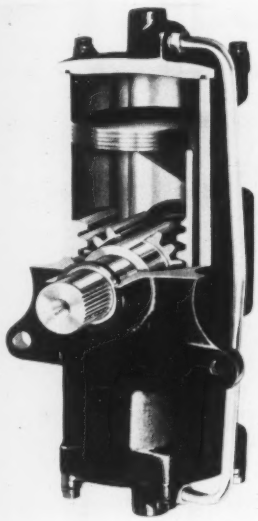
CHISHOLM-MOORE HOIST DIVISION
COLUMBUS McKINNON CHAIN CORPORATION
TONAWANDA, NEW YORK
REGIONAL OFFICES: NEW YORK, CHICAGO, CLEVELAND
In Canada: McKINNON COLUMBUS CHAIN LIMITED, ST. CATHARINES, ONTARIO

of 1050 to 1530 by using power magnetic amplifiers in series with rotor-circuit resistors.

The controller is contained in a louvered metal cabinet. All input and output connections are made at the bottom of the control panel. *Write*: Warren Mfg. Co., Littleton, Mass. *Phone*: Hunter 6-3511

Rotary Motion Cylinder

About 26,000 in.-lb of torque are delivered by this power cylinder which can be used wherever hydraulic or pneumatic pressure is available. It operates on 600 to 1000 psi.



Overrunning clutches, gears, and sprockets are easily adapted to the output shaft.

Parameters can easily be varied to obtain custom installations. *Write*: Michigan Div., Thompson Products Inc., 34201 Van Dyke Ave., Warren, Mich. *Phone*: Jefferson 9-5500

LP Gas Trucks

Liquefied petroleum gas fuel is optional in powering the Clark-lift line of fork trucks.

Components of the system are interchangeable on all models.

A flexible fuel line from the externally mounted tank to the fuel filter enables the hood to be opened without disconnecting the line.

A 375 psi relief valve is built in-

NEW PRODUCTS and equipment

to the tank. *Write*: Industrial Truck Div., Clark Equipment Co., Battle Creek, Mich. *Phone*: Woodward 2-6561

Pneumatic Sprays

Compressed air atomizes oil in the nozzle of a spray valve in this system.

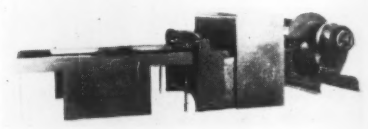
The sprays are used for grinding, milling, drilling, tapping, reaming, sawing, sheet stock oiling, hot chains, cams, cables, and diecasting molds.

The spray systems can be operated by gravity, siphon, air, or pump. The valves are of the external mixing type which reduces oil fog to a minimum. They produce a round spray pattern.

Each valve has two needle valves, one to control the flow of air and the other to control the oil. *Write*: Oil-Rite Corp., 2309 Waldo Blvd., Manitowoc, Wis. *Phone*: Murray 2-2428

Automatic Shear

Plantmaster decoils, straightens, shears, and stacks in one operation. The machine can cut metal up to 18 gage in widths to 4 ft.

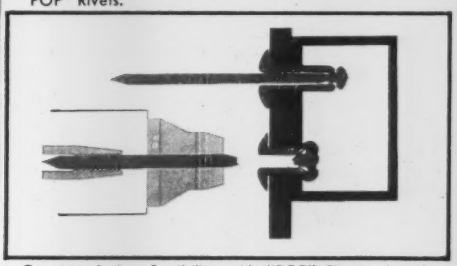


A special unit can shear tapered blanks. *Write*: Machinery Div., General Products Corp., Fredricksburg, Va.

"POP"® RIVETS PULL PARTS TOGETHER...

High Clinch Action Exerts to 600 Pounds Squeeze

Flat sheets that must be pulled to a contour and fastened from one side no longer pose a fastening problem with "POP" Rivets.



Greater design flexibility with "POP" Rivets. An air-operated pulling tool weighing only 1 lb. 14 oz. sets up to 1200 per hour with unskilled labor.

For parts that must be pulled together and fastened from one side, you can't beat the high clinching action of "POP" Rivets. Particularly effective for riveting curved panels, moldings, and trim — as well as for many mechanical and electrical assemblies.

"POP" Rivets are a new concept in fastening convenience. They are inserted in the hole and a pulling tool draws the setting mandrel through the rivet until the mandrel breaks under tension. This gives you a tight, positive, vibration-proof grip over a wide range of stock variations. A complete line of portable pulling tools to meet the most difficult types of installations in factory or field is available.

Investigate the many advantages of "POP" Rivets. Remember, "POP" Rivets can probably save you money on *assembly costs* even if your present fasteners are FREE. Write or call us today for further information or plant demonstration by one of our application engineers.

"POP" RIVET DIVISION

UNITED SHOE MACHINERY CORPORATION

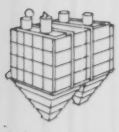
West Medway, Mass., KEystone 3-6611

Pay dirt!

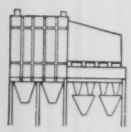
...year after year!

Buell Cyclone collectors pay off two ways: extra efficiency from the start . . . and extra years of operation, with little if any maintenance. Unique features like Buell's exclusive Shave-off deliver an extra percentage of dust collection efficiency: in nearly all cases, Buell installations pay for themselves in just a few years. And heavy plate construction, scientific proportioning, side entry of dust-laden gases are reasons why they keep on earning for many, many years. For specific details, write for "The Collection and Recovery of Industrial Dusts". Just write Dept. 26-H, Buell Engineering Company, Inc., 70 Pine Street, New York 5, N. Y.

BUELL CYCLONE



"SF" ELECTRIC PRECIPITATOR



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"Experts at delivering Extra Efficiency in

DUST COLLECTION SYSTEMS

NEW literature

Write directly to the company for a copy

Pillow Blocks

Bulletin A-668, 8 pages, lists data on dimensions, shaft sizes, weights, and radial load ratings of ball, roller, and sleeve bearing types of pillow blocks. Dodge Mfg. Corp., Mishawaka, Ind.

Arc Welding

Procedures, techniques and processes, currents, and typical uses of bronze electrodes, filler rod, and wire are covered in Bulletin W-17, 24 pages. Ampco Metal Inc., 1745 S. 38th St., Milwaukee 46, Wis.

Safety Shutoff Valve

Bulletin 22, 12 pages, describes a valve for use in coke oven gas or other dirty gas lines. Capacity tables for low and high pressure gas are included. North American Mfg. Co., 4455 E. 71st St., Cleveland 5, Ohio.

Shell-Molded Castings

The process, design, and materials of shell molding are discussed in Bulletin DB-52-520, 8 pages. Westinghouse Electric Corp., P. O. Box 2099, Pittsburgh 30, Pa.

Prestressed Concrete

Tensioning materials are described in this 16-page bulletin. John A. Roebling's Sons Corp., Trenton 2, N. J.

Carbide Tools

Details and prices of carbide tipped drills, reamers, end mills, countersinks, milling cutters, counterbores, and centers are listed in Catalog 57, 36 pages. Sales Dept., Super Tool Co., 21650 Hoover Rd., Detroit 13, Mich.

Grinding Wheels

Center-type wheels and their uses are discussed in Bulletin PG-341, 8 pages. Cincinnati Milling Products Div., Cincinnati Milling Machine Co., Cincinnati 9, Ohio.

Cranes

This publication contains specifications on cranes and monorails. Jervis B. Webb Co., 8951 Alpine Ave., Detroit 4, Mich.

Titanium

Corrosion resistance of titanium in anodizing operations is described in

NEW LITERATURE

a 4-page bulletin. Johnson & Funk Titanium Corp., W. Kemrow Ave., Wooster, Ohio.

Lifting Equipment

Catalog 157, 8 pages, describes a loading dock ramp which enables factory trucks to drive onto highway truck beds. Platform lifts, loading docks, and feed tables are covered in catalog 257, 8 pages. Catalog 357, 8 pages, discusses factory truck maintenance lifts. Joyce-Cridland Co., 2027 E. First St., Dayton, Ohio.

High-Temperature Fasteners

This 4-page bulletin gives tensile, fatigue and stress rupture data on fasteners at temperatures up to 900° F. Advertising Dept., Box 579, Standard Pressed Steel Co., Jenkintown, Pa.

Welding Handbook

Low alloy, high tensile steels are covered in this 64-page book. It gives chemical and physical properties of deposited weld metal, electrode applications, and preheat treatments. Properties and welding procedures for steels with 50,000 and 60,000 psi yield strengths are included. Alloy Rods Co., York, Pa.

Transmission Products

Catalog 914, 88 pages, describes transmission products and their uses in elevating and conveying machinery. Included are drawings and dimensions of shaft collars, couplings, clutches, pillow blocks, take-ups, wheel hubs, gears, holdbacks, chains, and sprocket wheels. Jeffery Mfg. Co., Columbus 16, Ohio.

Oilless Bearings

Catalog 240, 24 pages, describes self-lubricating bearings for roller and screw conveyors. Arguto Oilless Bearing Co., 149 W. Berkley St., Philadelphia 44, Pa.

Maintenance Costs

This 28-page booklet tells how to reduce cleaning and maintenance costs of buildings through the use of measured work studies. Advance Floor Machine Co., 4100 Washington Ave. N., Minneapolis 12, Minn.

Here's How Free Daylight Is Saving One Company $58,023.00

SEND FOR YOUR FREE COPY

This lighting cost analysis by an independent consulting engineer reveals the money actually being saved in one metal building through the use of Corrulux daylighting panels in place of artificial lighting. Comparative costs of both methods are projected over a ten-year period, indicating a savings with Corrulux, of over $58,000.00.

Similar savings are possible in your construction picture.

Write for your copy of this important analysis today. **On your letterhead, please.**

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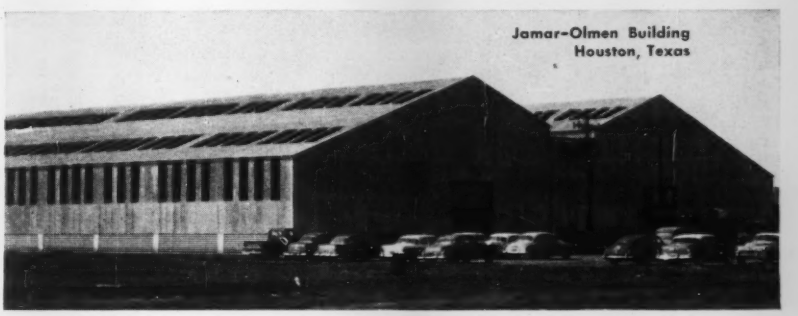

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RESTRICTED SPECIFICATION COLD ROLLED STRIP STEEL

Serves Typical Low Carbon End Use Requirements Such as these . . .

SIZE	8 x .045
ANALYSIS	1010
FINISH	#2 finish
HARDNESS	Non-Scalloping quality
THICKNESS TOLERANCE	± .0005 Incl. crown
WIDTH TOLERANCE	± .005
COIL SIZE	250# per inch of width
PACKAGING	Skidded

SIZE	12 x .032
ANALYSIS	1010
FINISH	#3 finish
HARDNESS	#4 Temper
THICKNESS TOLERANCE	± .0005 Incl. crown
WIDTH TOLERANCE	± .005
COIL SIZE	up to 200# per inch of width
PACKAGING	Paper interleaved—skidded and shrouded

SIZE	4 x .065
ANALYSIS	1010
FINISH	#2 finish
HARDNESS	#3 Temper
THICKNESS TOLERANCE	± .0005 Incl. crown
WIDTH TOLERANCE	± .005
COIL SIZE	Cut lengths
PACKAGING	Skidded

Many times, by varying processing methods, J&L is able to develop properties in cold rolled strip steel which greatly facilitate production operations and/or give the product superior qualities without adding to end product cost. End result is lower costs through improved products or better assembly and improved yield. We believe you will find it worthwhile to investigate the possibilities of J&L Restricted Specification Cold Rolled Strip Steel applied to your production.

THE 4 IN 1 SOURCE FOR YOUR COLD ROLLED STRIP STEEL

Now there are four J&L plants with facilities for production of "Restricted Specification" cold rolled strip. Strategic locations at Youngstown, Indianapolis, Los Angeles and Kenilworth, N. J., provide the security of 4 sources of supply plus the close working relationship which these local production centers make possible.

J & L Strip Steel Division Products

Low Carbon, High Carbon, Annealed or Hardened and Tempered Spring Steel, Electro Galvanized or Hot Dipped Continuous Galvanized, Tin Coated, Alloy, Stainless.

J&L STEEL

Jones & Laughlin
STEEL CORPORATION
STRIP STEEL DIVISION
GENERAL OFFICES: YOUNGSTOWN 1, OHIO

PLANTS: YOUNGSTOWN • INDIANAPOLIS • LOS ANGELES • KENILWORTH, NEW JERSEY
SALES OFFICES: New York • Rochester • Newington, Conn. • Youngstown • Cleveland Detroit • Indianapolis • Chicago • Los Angeles • San Francisco

FORMERLY THE COLD METAL PRODUCTS COMPANY

Market Outlook

STEEL INGOT production continues to strengthen—without the benefit of strong demand from the automobile industry, one of the two biggest consumers.

In the week ended Aug. 25, ingot output was at 82 per cent of capacity, the highest rate since the end of June. This marked the second consecutive week in which the rise was 1.5 points. Low point this summer was 78.5 per cent.

No one consuming group is supporting the ingot rate. Strength is across the board.

Only a small amount of steel is on order for early delivery for the 1958 model cars.

"ORDER NOW"— Some steel companies are advising their customers to place orders now for cold-rolled, hot-rolled, and silicon sheets to assure delivery in the fourth quarter, when the auto industry is expected to be taking increased tonnages of steel. Some customers are taking the advice, but most are confident they can get steel pretty close to the time they want it. They recognize that demand and production are about equal now and that ingot production is 18 points below capacity. They also expect no major interruptions to production.

PICKUP EXPECTED— A major producer of cold-rolled carbon sheets expects automobile industry orders to push up the steel operating rate by at least 5 points. The company, however, foresees enough cold-rolled sheets for everyone. Capacity to produce them has risen, and uninterrupted production is assured.

BACK TO WORK— Not only is the auto industry looked to for order increases, but so is the appliance industry, which has been working to reduce its inventory of finished goods. Westinghouse Electric Corp.'s appliance plant at Mansfield, Ohio, will call back 500 employees by Sept. 9. Around 100 were recalled a couple of weeks ago. Early this year, about 1000 employees were laid off there. The recalls are attributed to a pickup in appliance demand and the start of production of 1958 models.

CONSUMPTION IS HIGH— Even though steel consumption has declined, it has not gone down as much as steel production. One indication of this is a comparison of the Federal Reserve Board's seasonally adjusted metal fabricating index with the steel ingot rate. The metal fabricating index was only 1.1 per cent lower in July than in January, while the steel ingot production rate was down 19.1 per cent.

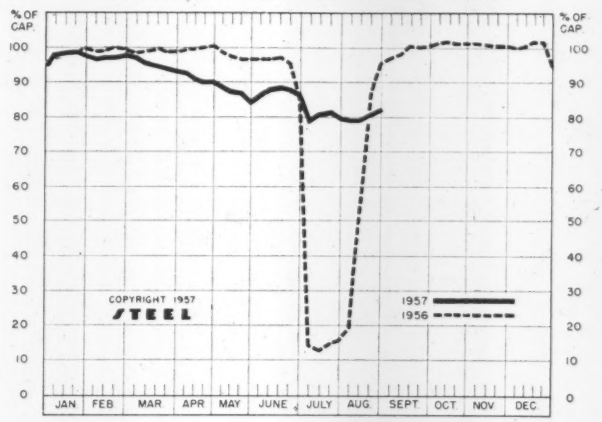
With steel consumption exceeding steel production, consumers have been drawing substantially upon their inventories.

LOOKING AHEAD— Despite the decline in steel production this summer, the output in the first eight months will be large enough so that the rest of the year need average only 85 per cent of capacity to make the year's total equal to the record of 117 million ingot tons (set in 1955).

To produce as much steel as was consumed in July would require a steel ingot rate of 89 per cent of capacity.

SCRAP DECLINES— Running counter to the possibilities of an upturn in steel production are scrap prices. In the week ended Aug. 21, STEEL's price composite on steelmaking scrap was $53.50 a gross ton, a 33 cent decline from that of the preceding week.

NATIONAL STEELWORKS OPERATIONS



DISTRICT INGOT RATES

(Percentage of Capacity Engaged)

	Week Ended Aug. 25	Change	Same Week 1956	Same Week 1955
Pittsburgh	83.5	+ 3*	96	95.5
Chicago	85.5	— 0.5*	97.5	95
Mid-Atlantic	88	+ 1.5	96	92
Youngstown	79	0	95	100
Wheeling	85	—11	95	96
Cleveland	90	0	100	97.5
Buffalo	95	0	102.5	105
Birmingham	85.5	0	85	98
New England	47	— 1	90	70
Cincinnati	83.5	+ 4.5*	85.5	92
St. Louis	79.5	— 5*	92	104
Detroit	84.5	+28*	90	68
Western	97	0	89	101
National Rate	82	+ 1.5	95.5	90

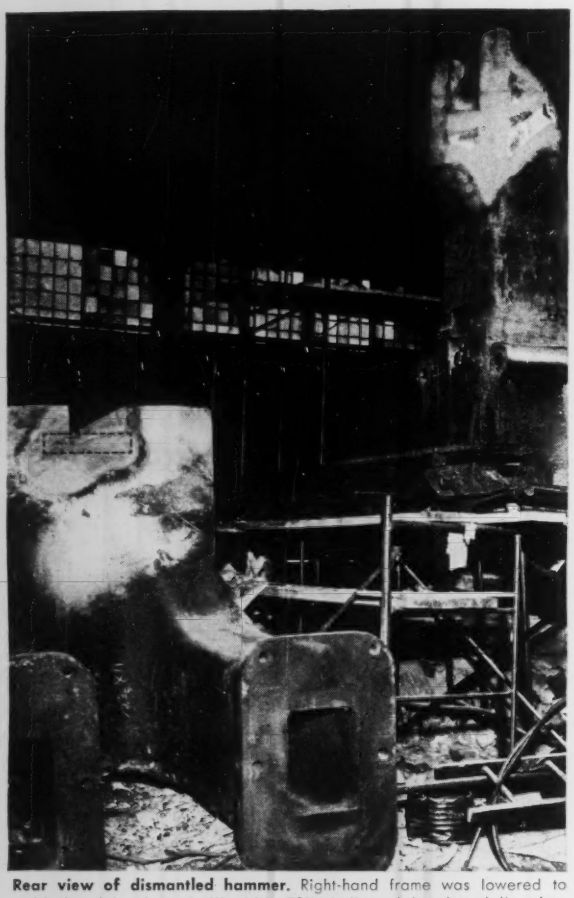
INGOT PRODUCTION‡

	Week Ended Aug. 25	Week Ago	Month Ago	Year Ago
INDEX (1947-1949=100)	132.2†	128.4	126.6	146.9
NET TONS (In thousands)	2,123†	2,062	2,033	2,359

*Change from preceding week's revised rate.
†Estimated. ‡Amer. Iron & Steel Institute.
Weekly capacity (net tons): 2,559,490 in 1957; 2,461,893 in 1956; 2,413,278 in 1955.

Metalworking Outlook—p. 29

Technical Outlook—p. 67



Rear view of dismantled hammer. Right-hand frame was lowered to weld the slab of steel—4" x 16" x 72", indicated by dotted line—into the guidepocket section. Left-hand frame was welded in vertical position.

The repaired steam hammer back in operation two months after the breakdown. Approximately 1850 pounds of Tobin Bronze Welding Rod were used. Color indicates location of welds visible from the front.

This mammoth repair saved $115,000... and six months' production time

A 16,000-pound, double-frame steam forging hammer in the plant of a leading tool steel manufacturer broke down early last November. The top portions of both side frames were broken into about 5 pieces each, and several pieces of flange near the steam cylinder were missing. The bed plates were badly damaged. There were between 700 and 800 linear inches of fractures in sections with wall thicknesses of 3 to 5 inches. To repair the hammer seemed a colossal undertaking—but it would take 8 months to get a new hammer into production at a cost of about $140,000.

Maintenance Engineering Corporation, Pittsburgh, Pa., which specializes in the rehabilitation of large industrial equipment, was called in to see if repairs were feasible. After careful study of the damage and an analysis of possible repair methods, their engineers chose braze-welding with Tobin Bronze Welding Rod. They estimated the hammer could be returned to service at a cost of approximately $25,000 or less than one-fifth the cost of a new hammer.

After dismantling and preparation, welding was under way by November 25. It took eight working days using 10 weldors on a 12-hour daily shift. The machine was back in production January 1—two months after it broke down—and is still going strong.

Maintenance Engineering Corp. uses Tobin Bronze Welding Rod for all welding repairs because the welds have good strength and the molten weld metal has excellent flowing properties. The latter enables them to control the weld puddle more effectively in vertical welds and other difficult positions.

There are Anaconda Welding Rods for a wide variety of repair and production applications. They are sold by distributors of welding equipment everywhere. For help in selecting the exact rod to fit your need, see your distributor or write: The American Brass Company, Waterbury 20, Conn. In Canada: Anaconda American Brass Ltd., New Toronto, Ont. 57114

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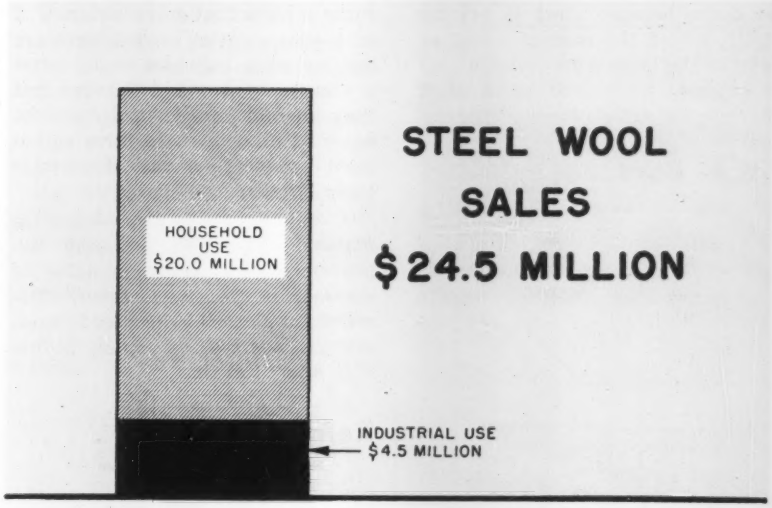

While housewives use the biggest portion of metal wool, industrial and commercial applications constitute an important market. Rising costs threaten the industry

EACH YEAR, the housewives of America consume something over $20 million dollars worth of steel in the form of small metal-wool pads for cleaning pots, pans, dishes, floors, woodwork, and a myriad of other household furnishings.

To makers of special carbon wire, this represents a small but important use of their product. Just how much wire is consumed this way is a well guarded secret, but the tonnage is increasing as the number of households rises. And with the emergence of aluminum as a leading material for pots and pans, that metal also is beginning to share in this market. Formerly, aluminum wool was used primarily by the Air Force for maintenance of aluminum aircraft and by manufacturers of air filters for heating equipment.

New uses are being found for other nonferrous metal wools, such as copper and bronze. Stainless steel wool also is gaining markets where resistance to corrosion is required.

Who Makes It—This small industry has 10 or 12 manufacturers. By far the biggest is Brillo Mfg. Co. Inc., Brooklyn, N. Y., which specializes in the familiar soap-filled pad for home use. Most of the smaller producers, such as International Steel Wool Corp., Springfield, Ohio, specialize in industrial or commercial uses for the versatile material.

Markets—In 1954, the latest year for which industrywide figures are available, the estimated market value of steel wool sold was $24.5 million. Industry officials indicate that the value of other metal wools is small by comparison.

Since then, several price increases and growing demand have probably boosted dollar value 25 or 30 per cent. The bulk of steel wool—some say between 80 and 90 per cent—goes into the home via hardware, grocery, and department stores. Most of the remainder goes to the furniture industry, painters' trade, and commercial laundry equipment makers.

Some metal wool goes into the metalworking industry for cleaning rust, paint, and other surface blemishes. This use is limited, some spokesmen say, because it involves too much hand labor, compared with other methods of cleaning. Metalworking plants find their greatest use of steel wool in maintenance work.

Nonferrous wools, by contrast, find the bulk of their use in metalworking. The Air Force found that when it cleaned aluminum aircraft with steel wool, some of the wool became embedded in the aluminum and in small cracks or joints. Galvanic action set in, pitting the aluminum. The solution was to use aluminum wool.

Army Ordnance found that in cleaning brass shell cases with steel wool, a galvanic action would result if the case became "contaminated" with the steel. This could cause premature firing of the charge. The solution: Brass wool.

A growing use of nonferrous metal wool is for air filters in heating or air conditioning units. Carey Electronic Engineering Co., Springfield, Ohio, says aluminum wool is best for applications involving recirculated air. Copper wool is recommended for industrial uses involving makeup or outside air.

Raw Materials—Most producers start with a special wire 0.105 to 0.122 in. in diameter. The carbon wire comes mainly from two producers—American Steel & Wire Div., U. S. Steel Corp., and Bethlehem Steel Co. Several producers supply stainless steel wire, but quality is a problem here because not enough is known about the physicals required. Most aluminum and brass mills can supply the nonferrous wire. The analyses of the wire are closely guarded. One producer is said to use a tubular product as its raw material.

In either case, production of metal wool involves the cutting of minute barbed strands of metal from the stock with high-speed cutting tools. These tools may have as many as 400 serrations to the lineal inch. When wire is used as the raw material, scrap loss—which ranges from 10 to 20 per cent—is a big problem. But at least one producer says he is developing a technique which will reduce his scrap loss by perhaps 3 per cent.

Machinery—There is no standard metal wool machine produced in the country. Most manufacturers either build their own or have them built. One German company—Eisen & Hammerwerk

GMBH—makes a machine for export. At least one is in operation in this country, but most are sold in South America.

Big Problem—One of the biggest problems facing the industry is price. The raw material is expensive to start with. Each increase in steel prices has made it harder for steel wool producers to compete with other materials such as plastic and sandpaper. One producer says his sales this year will be down because steel is pricing itself out of the market. But as long as the housewife cooks in pots and pans, there will be a good market for metal wool.

Steel Bars . . .

Bar Prices, Page 113

An upswing in inquiries for alloy and carbon hot-rolled bars is the only sign of increasing strength in that market. An alloy bar producer reports that manufacturers of such equipment as lawnmowers are making more inquiries about delivery in September and October, but they are not backed up by orders. Sales of alloy bars to farm equipment producers remain discouragingly light.

A cold-drawn bar producer in Pittsburgh doubts that any improvement will occur in sales to automakers before October. Demand from other industries is slow, and producers are accepting orders with short leadtime.

Reinforcing Bars . . .

Reinforcing Bar Prices, Page 113

The East's largest inquiry of the year for reinforcing steel is out for bids Oct. 24 to the state power authority: 30,000 tons for a powerplant at Lewiston, N. Y. Demand for reinforcing bars is heavy, but selling is competitive, with both price and delivery frequently important factors. Producers are maintaining a high rate of production and are meeting distributors' requirements.

On the West Coast, recent placements have been in small tonnages, causing a reduction in producers' order backlogs. A fair volume of steel requirements is noted for schools, churches, road projects, and small industrial plants. No project of major importance is up for early action.

Plates . . .

Plate Prices, Page 113

Plate mills have a substantial carryover into September on quality grades, notably hot topped, and are not increasing their fourth quarter allotments. Some mills which are booking on a monthly basis have no openings prior to November. This forecasts a strong market through the balance of this year.

The supply of light plates continues to improve. Users expect to receive shipments from strip mills in early fourth quarter, indicating that demand has not improved sufficiently to endanger the strip-mill plate supply.

Fabricating shops hesitate to accumulate a large inventory of strip-mill plates because of the narrow sizes. Users also are increasingly

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reluctant to pay premium prices for light gages because of the steady improvement in supply.

Stainless clad plate deliveries are better and can be made by some producers on an eight to ten-week basis. Deliveries on nickel-bearing clad plates are more extended and are being made chiefly to defense industries.

Shipyard requirements are heavier, especially for 1 to 2-in. plates. A higher ratio of orders is for alloy grades.

Sheets, Strip . . .

Sheet & Strip Prices, Pages 114 & 115

Salesmen for one of the smaller hot and cold-finished sheet producers in this area have been warning customers to place orders now for delivery in early fourth quarter. That firm expects automakers' orders to reach a firm plateau in October and to remain at that level throughout the fourth quarter. Some customer may be hard pressed to obtain steel in that period, although it's unlikely that sheet demand will equal supply. Several of the larger firms that make sheets expect to produce at only 80 to 85 per cent of capacity.

Although smaller producers point to a steadily increasing number of new orders from automakers, others say that one of the major auto producers has not made known its needs. In addition, buying by appliance makers is slow. Galvanized sheet demand is dull, lacking strong buying for grain bin construction which has characterized several previous years.

Sales of silicon sheets for fractional horsepower motors are slow, although demand for silicon from heavy electrical equipment makers is strong.

Deliveries of flat rolled steel will continue prompt through the third quarter. Most mills have built up stocks of semifinished carbon steel to meet demands over the balance of the year. Sheet mill schedules are gradually being built up to the extent that less light plate tonnage space is available. Demand for bright finished, cold rolled strip for slitting is slightly stronger.

Republic Steel's recently completed, 48 in., continuous galvanizing mill at Gadsden, Ala., has begun operations. A new galvan-

STEEL WAREHOUSE "TAKES TO THE AIR"

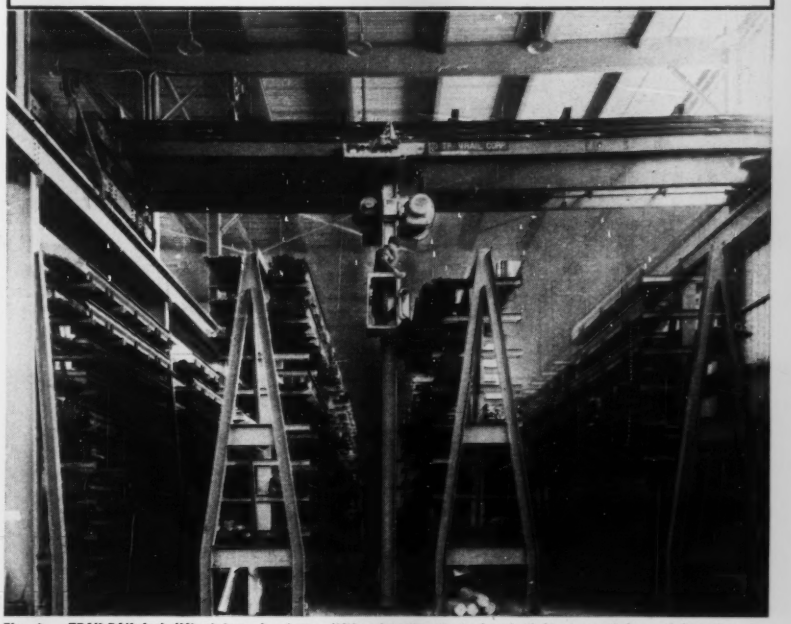

Fig. 1 — TRAK-RAK fork lift at top of column, lifting bundle of steel rod. Unit serves 3 long aisles of racks.

TRAK-RAK SYSTEM INCREASES STORAGE SPACE, SAVES 22% CAPITAL BUILDING INVESTMENT

When A. C. Leslie & Co. Limited, needed more storage area in its busy Toronto steel warehouse, it decided to "reach for the ceiling" with a Chicago Tramrail TRAK-RAK System of vertical storage and handling. As a result, the company estimates it not only saved 22% of projected capital building costs, but increased the overall efficiency and speed of the Toronto operation. The company expects to gain further economies as the TRAK-RAK system is used to its full extent.

A 5 ton capacity toprunning TRAK-RAK Crane was installed in each of two 40 ft. wide bays to serve specially designed 18 ft. high material storage racks (Fig. 1) Each crane bridge has an overhead trolley, from which is suspended an electrically operated rotating column

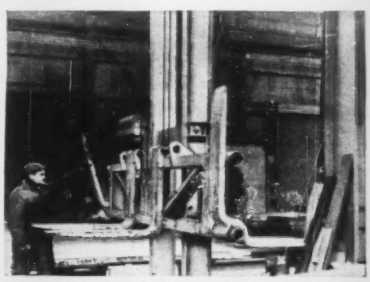

Fig. 2 — Carriage equipped with 2 pairs of forks. Operator is flopping outer forks up.

equipped with a special fork lift. All operations of the fork lift, which revolves to serve either side of the aisles, moves toward or away from the racks, and raises or lowers on the column, are controlled by the operator who rides with the carriage.

Two pairs of forks are mounted on the carriage. The outer forks may be flopped back (Fig. 2) leaving the inside forks in position for handling palletized or crated material. For handling long boxes, bars, etc., the outside forks are flipped back into working position.

A TRAK-RAK feature which added to handling speed and insured safe operation was the safety interlock switch system which prevents the column from running

Fig. 3 — TRAK-RAK column requires minimum aisle space for operation.

into a rack and permits full rotation only when the unit is safely beyond the end of the racks.

The A. C. Leslie Company reports that a similar TRAK-RAK System installed in its Montreal warehouse permitted a 37% savings in capital building investment with equally good operating efficiency and economy.

For complete details on the TRAK-RAK System of vertical storage and handling, write the manufacturer:

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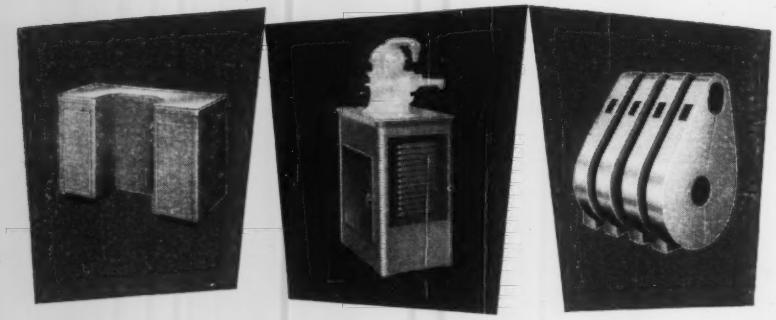
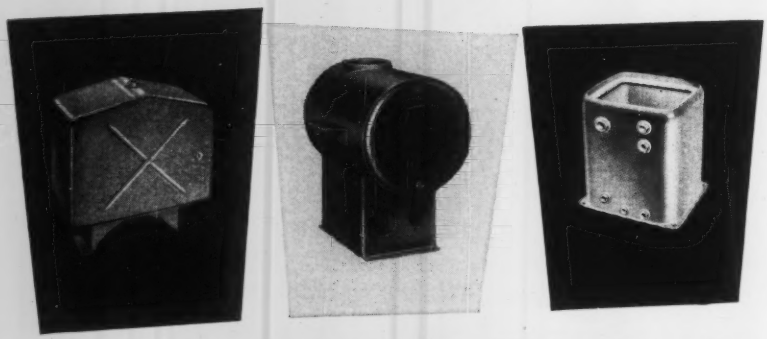


COMPONENT



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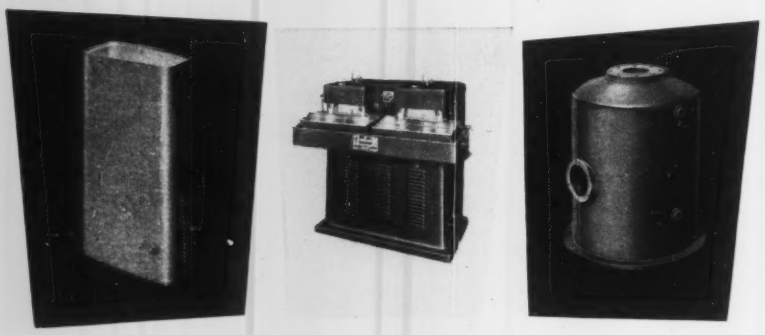

ized roofing sheet designed primarily for use by rapidly expanding southern industrial and farm markets is being introduced. Sheet and roofing production at the Gadsden plant is slated to be increased from 4000 to 10,000 tons a month. In addition, production goals call for 13,300 tons of cold-rolled sheets and 7000 tons of hot-rolled sheets a month. These products can be furnished in coils or cut lengths.

Tubular Goods . . .

Tubular Goods Prices, Page 117

For the first time in many months, oil country tube producers may not have to turn away orders in the fourth quarter. Demand will remain firm, particularly from foreign sources, but tubemakers who have opened books for the final three months expect to increase their sales efforts in that period. Declines in drilling in this country are blamed for the slight slowdown in demand.

Sales of buttweld pipe are the slowest part of the tube sales outlook. Slowdowns in residential building have cut requirements of that product. Seamless specialties are moving fairly well, without developing good strength.

Warehouse . . .

Warehouse Prices, Page 118

Distributors' sales of steel products have not shown significant gains from the low July levels. Demand has slowed for such products as tin plate and for lighter gages of plates. Sheet and strip requirements continue to be slow.

One warehouseman says small firms have difficulty in borrowing money for expansion. Their purchases remain restricted. Money shortages also limit the amount of steel inventories held by consumers.

No improvement in demand for flat-rolled products is expected until major automakers announce their requirements for early fourth quarter. Ordering is expected to tighten the sheet market considerably.

In the St. Louis district, demand from such fabricating industries as stoves and electric motors is disappointing. The building industry is moderately more active, but the change has not been reflected in warehouse steel bookings.

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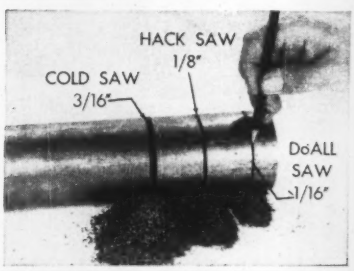
New DoALL Model C-12 "utility" Power Saw (12" x 12" capacity for stock weighing up to 1500 pounds), featuring *High-Speed Steel* saw bands.



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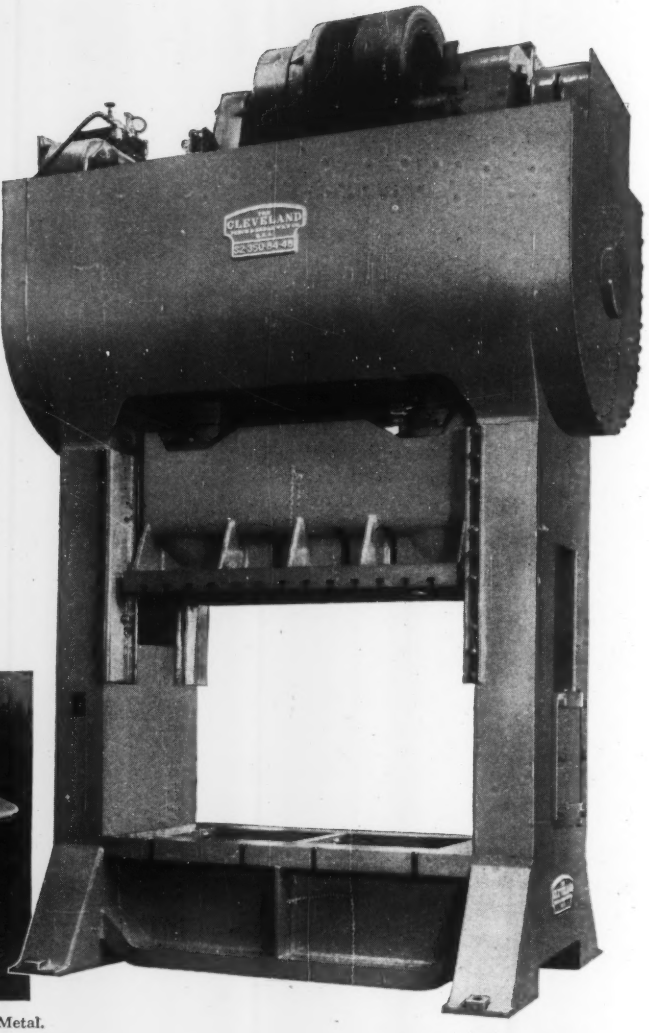

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On the West Coast, distributors' inventories are well balanced except for 2 in. and larger structurals and heavy plates. Consensus is that these items will be in ample supply by the fourth quarter. To reduce their heavy investment in large inventories, some houses plan to dispose of their surplus before year-end.

Wire . . .

Wire Prices, Pages 115 & 116

Wire mill bookings for September lag. The estimated increase of 10 to 15 per cent over August, a slow month, is falling short, although prompt shipments which are well ahead of normal leadtime may be holding back some orders. For fasteners, volume is near expectations, but with operations well under capacity, not too much increase in tonnage has been projected. The same holds for most spring grades.

Demand for general wire goods is off, and the hoped for pickup in automotive specifications will not help much in that direction. In scattered cases, some orders have been deferred. An exception to the trend is high tensile wire for prestressed concrete. Carbon wire for that use is well ahead of last year.

Tin Plate . . .

Tin Plate Prices, Page 115

Producers have full order books through September, but new orders are being received at a rate described as "only fair." While there is heavy need for tin plate to can the crops that remain, users have no need to keep inventories high in the fourth quarter. So they will probably curtail their orders in that period. Several tomato producing sections of Pennsylvania have suffered from lack of rain this month. The drought may affect need for tin plate to can tomatoes, but declines in eastern crops may not lower over-all requirements.

Can companies in the West have reduced their consumption of tin plate a little, compared with the amount reported last year, but they will take large supplies in the months ahead to accumulate inventories.

Rails, Cars . . .

Track Material Prices, Page 116

Freight car deliveries to railroads in July totaled 7725 units, compared with 8377 in June and 5344 in July, 1956. Orders for new freight cars dropped to 1251 last month from 4918 in June and 2642 in July, 1956. Car shops had unfilled orders on Aug. 1 of 85,229 units, compared with 91,810 on July 1.

Ferroalloys . . .

Ferroalloy Prices, Page 121

To make ferroalloy briquets and other foundry alloys more readily available to its customers in the Great Lakes areas, Electro Metallurgical Co., a division of Union Carbide Corp., New York, has expanded shipping and processing facilities for these products.

Deliveries of foundry alloys are being made from two new shipping points: Ashtabula, Ohio, plant and the Chicago warehouse. All deliveries previously had originated from the Alloy, W. Va., plant.

Briquets of standard ferromanganese, silicomanganese, and 50 per cent ferrosilicon, as well as the foundry sizes of those alloys and low-aluminum 90 per cent ferrosilicon, are available from the new locations as a result of the installation of crushing and briquetting equipment at the Ashtabula plant.

Union Carbide also is constructing a large addition to the Process Research Bldg., Metals Research Laboratories, Niagara Falls, N. Y. The 2900 sq-ft addition, scheduled for completion in November, will more than double the space available for research in chemical metallurgy at the research and development center.

Structural Shapes . . .

Structural Shape Prices, Page 113

Allotments of structural shapes from mills remain steady. There is little likelihood of an increase in quotas next month.

Repairs to soaking pits at a mill in the Pittsburgh district continue to restrict output of wide flange beams and other structural shapes. Deliveries have been slowed by two or three weeks since the second quarter.

Supply of lighter structurals is improving. Users report they can obtain quicker delivery on products rolled on bar mills than they could earlier in the year. On the other structural products, users are clamoring for improved deliveries.

In the Mid-Atlantic district, fabricating shops do not expect to receive in the near future any increased tonnage of wide flange and heavy sections, despite a high operating rate at the mills. One producer is operating 20 to 21 turns, but is making scheduled deliveries with difficulty. At Lackawanna, N. Y., an increase in demand for sheet and other products may soon divert more semifinished steel from the structural mills. The load on the 28-in. mill is heavy.

In New England, expansion by insurance companies continues with office buildings accounting for 5000 tons. Bridge tonnage estimated in Connecticut also is higher, but lags in other states in the district. A month-long strike at 19 fabricating shops in the Boston district has resulted in dislocation of some tonnage awards for schools, defense structures, and bridges. Although the larger fabricating shops are extended a year or more, notably for bridges, openings in schedules are appearing more frequently for earlier shipment.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

3300 tons, viaduct, Dover-Union Park Street, J. F. Fitzgerald Expressway, Boston, to Grand Iron Works, New York; M. DeMatteo Construction Co., Quincy, Mass., general contractor.

3460 tons, 18-story office building and 5-story office addition, *Daily News*, New York, to Bethlehem Fabricators Inc., Bethlehem, Pa. (2180 tons) and Schacht Structural Steel Co., Hillside, N. J.; Turner Construction Co., New York, general contractor.

1000 tons, powerplant, Luzerne Electric Div., United Gas Improvement Co., Hunlock Creek, Pa., to Bethlehem Fabricators Inc., Bethlehem, Pa., through United Engineering & Constructors Inc., Philadelphia, general contractor.

810 tons, maintenance hangar, NAS, Oceana, Va., to Globe Iron Construction Co. Inc., Norfolk, Va.; Doyle & Russell, Norfolk, general contractor; 75 tons, reinforcing bars, Hall-Hodges Co., Norfolk.

670 tons, nurses home, hospital, Harrisburg, Pa., to Bethlehem Fabricators Inc., Bethlehem, Pa.

515 tons, hangar and facilities, Kelly AFB, Texas, to Alamo Iron Works, San Antonio, Tex.; R. F. Ball Construction Co., San Antonio, general contractor.

500 tons or more, superstructure highway bridge, Noxon Rapids, Mont., power project, to Allied Structural Steel Co., Chicago, by Washington Water Power Co.

500 tons, three bridges, Washington Memorial Pike, Montgomery County, Maryland, to Atlas Machine & Iron Works, Arlington, Va.; J. O. and C. M. Stuart Inc., Washington, general contractor.

470 tons, sheet metal and welding shop, Painted Post, N. Y., to American Bridge Div., U. S. Steel Corp., Pittsburgh; H. K.

Ferguson Co., New York, general contractor.

400 tons, addition, Superior Rubber Co., Evansburg, Pa., to Keystone Structural Steel Co., Trenton, N. J.; Mahony-Troast Construction Co., Camden, N. J., general contractor.

300 tons, Carlton bridge widening and west approach, Bath-Woolwich, Me., to Bancroft & Martin Rolling Mills Co., South Portland, Maine; Seaboard Engineering Co. Inc., Portland, general contractor.

255 tons, junior high school, Shreveport, La., to Mosher Steel Co., Houston; Southern Builders Inc., Shreveport, general contractor.

250 tons, penstock and gates, Swift No. 2 powerhouse, Washington state, to Monarch Iron & Steel Co., Portland, Oreg., low $75,852, to Cowlitz County PUD No. 1, Longview, Wash.

250 tons, plant addition, Foxboro Co., Foxboro, Mass., to Groisser & Shlager Iron Works, Somerville, Mass.; Vappi & Co. Inc., Cambridge, Mass., general contractor; 50 tons, reinforcing, Concrete Steel Co., Boston.

200 tons, tunnel ribs, Blackstone River Worcester, Mass., flood control project, Auburn-Millbury, Mass., to Commercial Shearing & Stamping Co., Youngstown; Peter Kero and Curley Construction Co. Inc., Rochelle Park, N. J., joint contractors.

STRUCTURAL STEEL PENDING

5300 tons, 600-ft span hinged arch bridge with composite I-beam approaches, Mohawk River, Route 502, Latham-Clifton Park, Albany-Saratoga counties, New York; bids Aug. 29, Albany.

1200 tons, state highway bridges, Lehigh County, Pennsylvania; James Morrissey & Co., Philadelphia, low, general contract.

1120 tons, state highway structures, Erie County, Section 3, Pennsylvania; bids Sept. 13, Harrisburg, Pa.

1000 tons, I-beam bridges (two) and 348-foot girder span, Saratoga-Albany Counties, New York; bids Aug. 29, Albany.

950 tons, power plant, Yankee Atomic Energy Corp., Rowe, Mass.; Stone & Webster Engineering Corp., New York, general contractor.

700 tons, warehouse for California Bag Co., Portland, Oreg.; bids in Aug. 19.

675 tons, Nisqually River bridge, Washington state; bids in to Bureau of Public Roads; 220 tons reinforcing also involved.

400 tons, state highway bridges, Allegheny County, Pennsylvania, LR-802; bids Sept. 13, Harrisburg.

115 tons, state highway bridge, Lehigh County, Section 21, Pennsylvania; Glasgow Construction Co., Philadelphia, low, general contract.

100 tons, Garfield Street overpass, Seattle; bids Aug. 21.

100 tons or more, Oregon state, Linn County, overcrossing; Roy L. Houck & Son, Salem, Oreg., low $666,289.

100 tons, bridge near Forks, Wash.; bids to Bureau of Public Roads, Aug. 22.

REINFORCING BARS . . .

REINFORCING BARS PLACED

850 tons, Forestdale Chemical Bldg., Philadelphia, to Bethlehem Steel Co., Bethlehem, Pa., through Hughes-Foulkrod Co., Philadelphia, general contractor.

560 tons, Carlton bridge widening and west approach, Bath-Woolwich, Maine, to Bancroft & Martin Rolling Mills Co., South Portland, Maine; Seaboard Engineering Co. Inc., Portland, Maine, general contractor.

500 tons, state highway structures, Route 108, Camden County, New Jersey, to Taylor-Davis Co., Philadelphia, through Public Constructors Inc., general contractor.

285 tons, barracks, Ft. Huachuca, Ariz., to Acme Steel Co., Phoenix, Ariz.; Rutherford Construction Co., Albuquerque, N. Mex., general contractor; structurals, Allison Steel Mfg. Co., Phoenix, Ariz.

225 tons, junior high school, Shreveport, La., to Mosher Steel Co., Houston; Southern Builders Inc., Shreveport, general contractor.

220 tons, hospital addition, Metheun, Mass., to Northern Steel Inc., Medford, Mass.; G. L. Rugo & Son Inc., Boston, general contractor; structurals, Builders' Iron Works, Boston.

210 tons, three bridges, Washington Memorial Pike, Montgomery County, Maryland, to Rosslyn Steel & Cement Co., Washington; J. O. and C. M. Stuart Inc., Washington, general contractor.

170 tons, engineering missile support building, Redstone Arsenal, Huntsville, Ala., to Ceco Steel Products Inc., Birmingham; Daniel Construction Co. Inc., Birmingham, general contractor.

110 tons, hangar and facilities, Kelley AFB, Texas, to Alamo Iron Works, San Antonio, Tex.; R. F. Ball Construction Co. Inc., San Antonio, general contractor.

100 tons, Boeing building addition and miscellaneous, to Bethlehem Pacific Coast Steel Corp., Seattle.

REINFORCING BARS PENDING

30,000 tons, Lewiston powerplant, Niagara County, New York; bids Oct. 24, Power Authority, New York; also 350 tons of miscellaneous metalwork and erection of 2500 tons of structural steel; 6500 tons, gates, trash racks, stop logs, hatch covers, and cranes; 7800 tons, erection of turbines; 2600 tons, handling spiral castings; 22,000 tons, handling generator parts and electrical equipment.

8965 tons, intake shafts and upstream tunnels, power structure, Oahe reservoir project, near Pierre, S. Dak.; bids about Sept. 20, Corps of Engineers, Omaha, Nebr.; also 4925 tons, structural steel and 100 tons wire mesh.

1600 tons, precast prestressed concrete arch bridge, Northern Illinois Toll Highway, Contract E-1B, Aurora Township, Kane County, Ill., for Illinois State Toll Highway Commission, Chicago; bids Sept. 5.

600 tons, two Montana state Beaverhead County, railroad overpasses (also shapes on lump sum basis); bids to Helena, Mont., Aug. 30.

190 tons, Washington state Whatcom County overpass; bids to Olympia, Aug. 27.

180 tons, two Montana state highway projects, Cascade and Beaverhead counties; bids to Helena, Mont., Aug. 30.

150 tons, Washington state highway bridge, Whatcom County; general contract to Wilder Construction Co., Bellingham, Wash.

115 tons, Richmond Highlands, concrete water reservoir, Seattle; Kuney-Johnson Co., Seattle, low $261,846.

PLATES . . .

PLATES PENDING

1500 tons, 14,000 ft, 48 and 42 in. steel water pipe; Beall Pipe & Tank Co., Portland, Oreg., low $392,038 to Everett, Wash.

500 tons, Richmond Highlands 2 million gal elevated steel tank, Seattle; Pittsburgh-Des Moines Steel Co., Seattle, low $255,978.

250 tons, 5000 ft, 36 and 24 in. water supply pipe; rebids to Port of Tacoma, Wash., Aug. 28.

PIPE . . .

CAST IRON PIPE PLACED

220 tons, 8 and 6 in. cast iron pipe, Moses Lake, Wash., to U. S. Pipe & Foundry Co., Seattle.

189 tons, 12 to 24-in., system expansion, Clackamas, Oreg., to U. S. Pipe & Foundry Co., Seattle.

103 tons, 4200 ft, 10-in., Port Orchard, Wash., to U. S. Pipe & Foundry Co., Seattle.

CAST IRON PIPE PENDING

350 tons, 24-in. system expansion; bids rejected by Port of Tacoma, Wash.; rebids soon.

200 tons, 16 and 12 in. cast iron pipe; bids to Seattle, Aug. 21.

100 tons or more, 8 to 4 in. King County (Wash.) water district No. 92; Argentieri & Colarosso, Seattle, low $130,000.

RAILS, CARS . . .

RAILROAD CARS PENDING

Bureau of Mines, Amarillo, Tex., 15 tank cars for compressed helium gas.

Imported Steel

Prices per 100 lbs. (except where otherwise noted) landed, including customs duty, but no other taxes.

	Atlantic & Gulf Coast	West Coast	Vancouver	Montreal
Deformed Bars (⅝" Dia. incl. all extras)	$6.78	$7.01	$6.76	$6.44
Merchant Bars (¼" Round incl. all extras)...	7.62	7.85	7.48	7.22
Bands (1"x⅛"x20' incl. all extras)	7.76	7.98	7.65	7.38
Angles (2"x2"x¼" incl. all extras)	6.57	6.75	6.99	6.69
Beams & Channels (base)	6.82	7.00	7.24	6.94
Furring Channels (C.R. ¾", per 1000')	26.62	27.77	....	....
Barbed Wire (per 82 lb. net reel)	6.95	7.40	7.75	7.80
Nails (bright, common, 20d and heavier)	8.38	8.58	9.07	8.99
Larssen Sheet Piling (section II, new, incl. size extra)	7.80	8.10	8.10	7.80
Wire, Manufacturer's, bright, low C, (11½ga.)	7.38	7.52	8.52	8.52
Wire, galvanized, low C, (11½ ga.)	8.01	8.15	9.42	9.42
Wire, Merchant quality, bl. ann., (10 ga.)...	7.60	7.75	8.78	8.78
Rope Wire (.045", 247,000 PSI, incl. extras)..	13.60	13.75	13.00	13.00
Wire, fine and weaving, low C, (20 ga.)	10.66	10.80	10.17	12.17
Tie Wire, autom. baler (14G, 97 lbs. net)....	9.58	9.73	9.64	9.54
Merchant Pipe (⅛" galv. T & C, per 100')...	8.48	8.83	....	....
Casing (5½", 15.5 J55, T & C, per 100')	194.00	199.00	....	....
Tubing (2⅜", 6.4 J55, EUE, per 100')	103.00	104.00	....	....
Forged R Turn. Bars, C-1035 (from 10" dl.).	14.00	14.23	14.00	13.74

Ask prices on: Bulb tees, bolts and nuts, manganese steel plates and shapes, welded wire reinforcing mesh and hardware cloth, boiler tubes, A-335-P11 pressure pipe.

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Through Stahlunion-Export GmbH

BOCHUMER VEREIN World's first Steel Foundry, 1842—Vacuum degassed Forgings. Pinion wire and spring wire for watches and clocks.

DORTMUNDER UNION Originators of Interlock Sheet Piling—Larssen Sheet Piling, Plate, Shapes, Forged Bars and Shafts.

NIEDERRHEIN Europe's most modern Rod Mill—OH, CH, Low Metalloid, Specialty Wire Rod, Merchant Bars.

WESTFAELISCHE UNION Europe's largest Wire Mill—All types drawn Wire and Wire Products—Nails, Barbwire, Wire Rope, Prestress Concrete Wire and Strand.

PHOENIX RHEINROHR Europe's largest Pipe Mill—Pipe, Tubing, Flanges, Welding Fittings, Precision Tubes, Tubular Masts.

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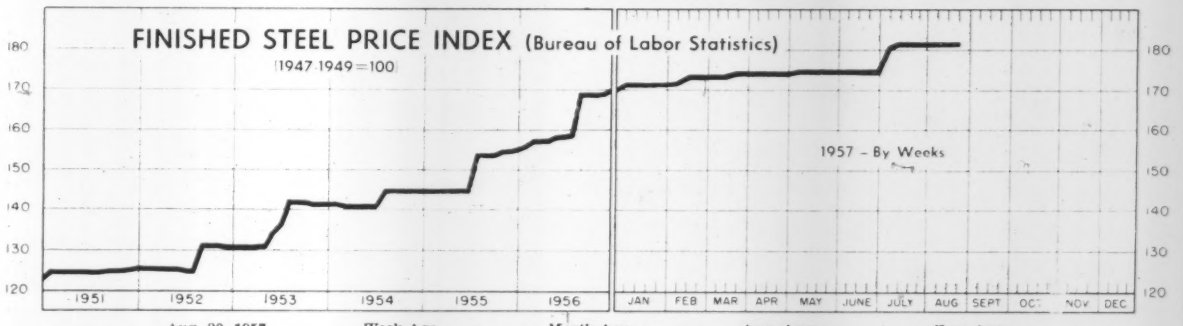
Price Indexes and Composites



Aug. 20, 1957	Week Ago	Month Ago	Aug. Avg.	Year Ago
181.5	181.5	181.5	181.5	168.6

AVERAGE PRICES OF STEEL (Bureau of Labor Statistics)

Week Ended Aug. 20

Prices include mill base prices and typical extras and deductions. Units are 100 lb except where otherwise noted in parentheses. For complete description of the following products and extras and deductions applicable to them, write to STEEL.

Rails, Standard, No. 1	$5.600	Bars, Reinforcing	6.210
Rails, Light, 40 lb	7.067	Bars, C.F., Carbon	10.360
Tie Plates	6.600	Bars, C.F., Alloy	13.875
Axles, Railway	9.825	Bars, C.F., Stainless, 302 (lb)	0.553
Wheels, Freight Car, 33 in. (per wheel)	60.00	Sheets, H.R., Carbon	6.192
Plates, Carbon	6.150	Sheets, C.R., Carbon	7.089
Structural Shapes	5.942	Sheets, Galvanized	8.220
Bars, Tool Steel, Carbon (lb)	0.480	Sheets, C.R., Stainless, 302 (lb)	0.688
Bars, Tool Steel, Alloy, Oil Hardening Die (lb)	0.585	Sheets, Electrical	12.108
Bars, Tool Steel, H.R., Alloy, High Speed, W 6.75, Cr 4.5, V 2.1, Mo 5.5, C 0.60 (lb)	1.274	Strip, C.R., Carbon	9.193
Bars, Tool Steel, H.R., Alloy, High Speed, W18, Cr 4, V 1 (lb)	1.769	Strip, C.R., Stainless, 430 (lb)	0.493
Bars, H.R., Alloy	10.525	Strip, H.R., Carbon	6.245
Bars, H.R., Stainless, 303 (lb)	0.525	Pipe, Black, Buttweld (100 ft)	19.814
Bars, H.R., Carbon	6.425	Pipe, Galv., Buttweld (100 ft)	23.264
		Pipe, Line (100 ft)	199.023
		Casing, Oil Well, Carbon (100 ft)	194.499
		Casing, Oil Well, Alloy (100 ft)	304.610
		Tubes, Boiler (100 ft)	49.130
		Tubing, Mechanical, Carbon (100 ft)	24.953
		Tubing, Mechanical, Stainless, 304 (100 ft)	205.608
		Tin Plate, Hot-dipped, 1.25 lb (95 lb base box)	9.783
		Tin Plate, Electrolytic, 0.25 lb (95 lb base box)	8.483
		Black Plate, Canmaking Quality (95 lb base box)	7.583
		Wire, Drawn, Carbon	10.225
		Wire, Drawn, Stainless, 430 (lb)	0.653
		Bale Ties (bundle)	7.967
		Nails, Wire, 8d Common	9.828
		Wire, Barbed (80-rod spool)	8.719
		Woven Wire Fence (20-rod roll)	21.737

STEEL's FINISHED STEEL PRICE INDEX*

	Aug. 21 1957	Week Ago	Month Ago	Year Ago	5 Yr Ago
Index (1935-39 avg=100)	239.15	239.15	239.15	225.71	181.40
Index in cents per lb	6.479	6.479	6.479	6.114	4.914

STEEL's ARITHMETICAL PRICE COMPOSITES

Finished Steel, NT	$146.19	$146.19	$146.19	$137.59	$113.23
No. 2 Fdry Pig Iron, GT	66.49	66.49	66.49	62.63	52.54
Basic Pig Iron, GT	65.99	65.99	65.99	62.18	52.16
Malleable Pig Iron, GT	67.27	67.27	67.27	63.41	53.27
Steelmaking Scrap, GT	53.50	53.83	54.00	58.17	43.00

*For explanation of weighted index see STEEL, Sept. 19, 1949, p. 54; of arithmetical price composite, STEEL, Sept. 1, 1952, p. 130.

Comparison of Prices

Comparative prices by districts, in cents per pound except as otherwise noted. Delivered prices based on nearest production point

FINISHED STEEL	Aug. 21 1957	Week Ago	Month Ago	Year Ago	5 Yr Ago
Bars, H.R., Pittsburgh	5.425	5.425	5.425	5.075	3.95
Bars, H.R., Chicago	5.425	5.425	5.425	5.075	3.95
Bars, H.R., deld., Philadelphia	5.715	5.715	5.715	4.93	4.502
Bars, C.F., Pittsburgh	7.30*	7.30*	7.30*	6.85*	4.925
Shapes, Std., Pittsburgh	5.275	5.275	5.275	5.00	3.85
Shapes, Std., Chicago	5.275	5.275	5.275	5.00	3.85
Shapes, deld., Philadelphia	5.585	5.585	5.585	5.00	4.13
Plates, Pittsburgh	5.10	5.10	5.10	4.85	3.90
Plates, Chicago	5.10	5.10	5.10	4.85	3.90
Plates, Coatesville, Pa.	5.50	5.50	5.50	5.25	4.35
Plates, Sparrows Point, Md.	5.10	5.10	5.10	4.85	3.90
Plates, Claymont, Del.	5.70	5.70	5.70	5.35	4.35
Sheets, H.R., Pittsburgh	4.925	4.925	4.925	4.675	3.775
Sheets, H.R., Chicago	4.925	4.925	4.925	4.675	3.775
Sheets, C.R., Pittsburgh	6.05	6.05	6.05	5.75	4.575
Sheets, C.R., Chicago	6.05	6.05	6.05	5.75	4.575
Sheets, C.R., Detroit	6.05-6.15	6.05-6.15	6.05-6.15	5.325-5.425	4.775
Sheets, Galv., Pittsburgh	6.60	6.60	6.60	6.30	5.075
Strip, H.R., Pittsburgh	4.925	4.925	4.925	4.675	3.75-4.00
Strip, H.R., Chicago	4.925	4.925	4.925	4.675	3.725
Strip, C.R., Pittsburgh	7.15	7.15	7.15	6.85	5.10-5.80
Strip, C.R., Chicago	7.15	7.15	7.15	6.85	5.35
Strip, C.R., Detroit	7.25	7.25	7.25	6.35-6.95	5.30-5.60
Wire, Basic, Pittsburgh	7.65	7.65	7.65	7.20	4.85-5.225
Nails, Wire, Pittsburgh	8.95	8.95	8.95	8.35	5.90-6.35
Tin plate (1.50 lb) box, Pitts.	$10.30	$10.30	$10.30	$9.85	$8.95

*Including 0.35c for special quality.

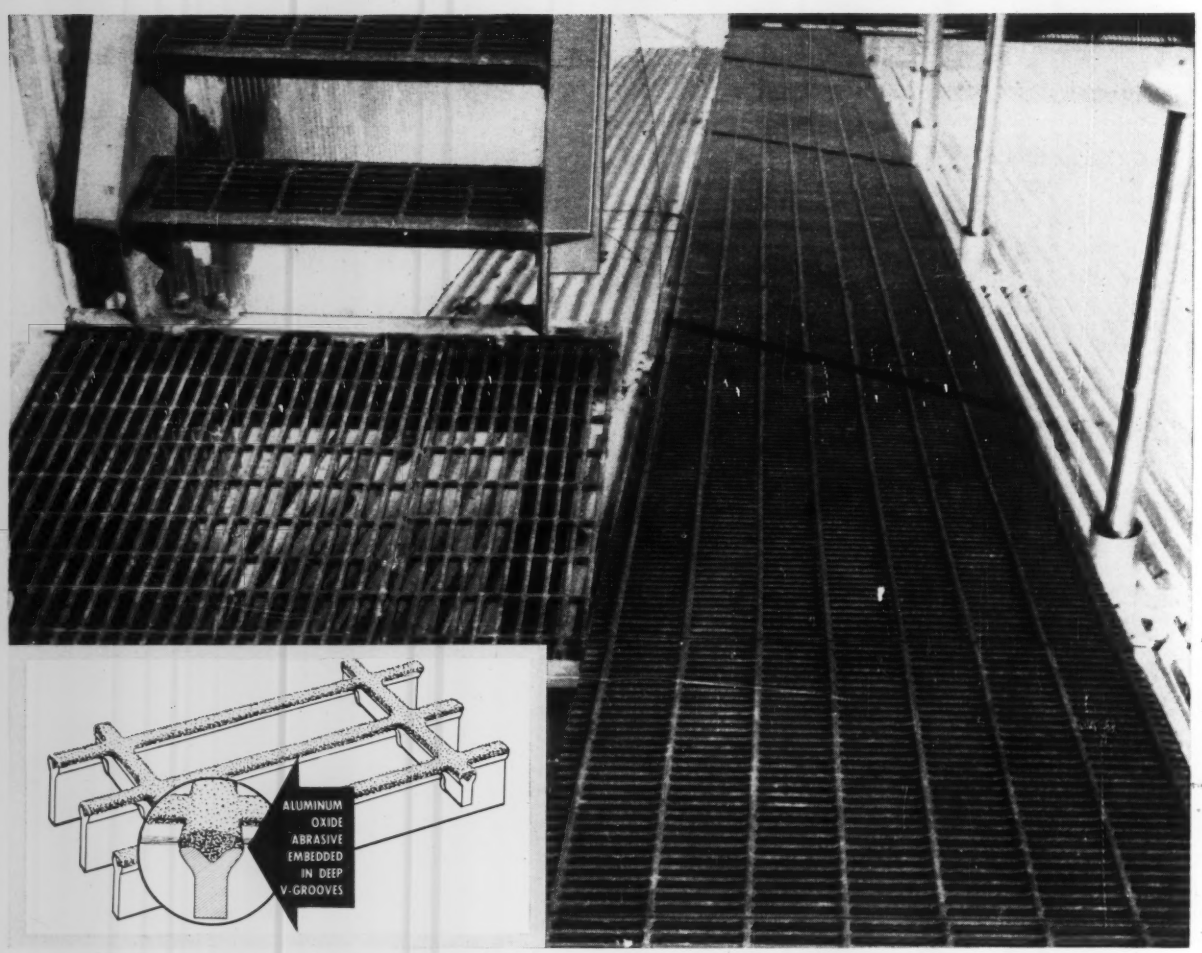
SEMIFINISHED STEEL					
Billets, forging, Pitts. (NT)	$96.00	$96.00	$96.00	$91.50	$70.50
Wire rods, 5/16-7/8" Pitts.	6.15	6.15	6.15	5.80	4.325

PIG IRON, Gross Ton	Aug. 21 1957	Week Ago	Month Ago	Year Ago	5 Yr Ago
Bessemer, Pitts.	$67.00	$67.00	$67.00	$63.50	$53.00
Basic, Valley	67.00	64.50	67.00	62.50	52.00
Basic, deld., Phila.	69.88	69.88	69.88	66.26	56.75
No. 2 Fdry, NevilleIsland, Pa.	66.50	66.50	66.50	63.00	52.50
No. 2 Fdry, Chicago	66.50	66.50	66.50	63.00	52.50
No. 2 Fdry, deld., Phila.	70.38	70.38	70.38	66.76	57.25
No. 2 Fdry, Birm.	62.50	62.50	62.50	59.00	48.88
No. 2 Fdry (Birm.) deld. Cin.	70.20	70.20	70.20	66.70	56.43
Malleable, Valley	66.50	66.50	66.50	63.00	52.50
Malleable, Chicago	66.50	66.50	66.50	63.00	52.50
Ferromanganese, Duquesne	255.00†	255.00†	255.00†	215.00†	228.00*

†74-76% Mn, net ton. *75-82% Mn, gross ton, Etna, Pa.

SCRAP, Gross Ton (Including broker's commission)					
No. 1 Heavy Melt, Pittsburgh	$55.50	$55.50	$55.50	$57.50	$44.00
No. 1 Heavy Melt, E. Pa.	52.00	52.00	53.50	58.00	41.50
No. 1 Heavy Melt, Chicago	53.00	54.00	53.00	59.00	42.50
No. 1 Heavy Melt, Valley	55.50	55.50	54.50	64.50	44.00
No. 1 Heavy Melt, Cleve.	52.50	52.50	51.50	62.00	43.00
No. 1 Heavy Melt, Buffalo	49.50	49.50	46.50	56.50	43.00
Rails, Rerolling, Chicago	74.50	76.50	79.50	83.50	52.50
No. 1 Cast, Chicago	46.50	47.50	47.50	53.50	48.50

COKE, Net Ton					
Beehive, Furn., Connlsvl.	$15.25	$15.25	$15.25	$14.50	$14.75
Beehive, Fdry., Connlsvl.	18.25	18.25	18.25	17.50	17.00



RELGRIT® provides safe footing on sharply sloping roofs at AEC St. Louis Plant

Reliance Relgrit gratings and treads are providing safe access to stacks, filters and other equipment across the 18° sloping roof of the AEC Feed Material Plant near St. Louis. The abrasive surface of Relgrit was picked as a truly non-skid surface for ramps, stairways and walks leading to equipment which had to be serviced frequently.

The top surfaces of the bearing bars have 1/8" deep V-grooves in which is embedded aluminum oxide abrasive grains in a hard resin. The material is not affected by water, oil, gasoline, greases, or the most commonly used acids, alkalis and other chemicals, which gives it a long service life under the most severe conditions. If you have operations in which the floors become oily, greasy, wet, or slick from any other cause, Relgrit can provide safe footing at very low cost. Write for complete information and samples.

*you can't slip on Relgrit**

*Patent applied for

Reliance Steel Products Company

P. O. Box 510-L, McKeesport (Pittsburgh District), Pa.

Relgrit Abrasive Gratings and Treads • Lightweight Bridge Flooring
Steel, Stainless and Aluminum Grating • Steel Mill Equipment

Steel Prices

Mill prices as reported to STEEL, Aug. 21, cents per pound except as otherwise noted. *Changes shown in italics.* Code numbers following mill points indicate producing company. Key to producers, page 114; to footnotes, page 116.

SEMIFINISHED

INGOTS, Carbon, Forging (NT)

Munhall,Pa. U5 .....$73.50

INGOTS, Alloy (NT)

Detroit S41 .....$77.00
Farrell,Pa. S3 .....77.00
Lowellville,O. S3 .....77.00
Midland,Pa. C18 .....77.00
Munhall,Pa. U5 .....77.00
Sharon,Pa. S3 .....77.00

BILLETS, BLOOMS & SLABS Carbon, Rerolling (NT)

Bessemer,Pa. U5 ....$77.50
Bridgeport,Conn. N19 ..80.50
Buffalo R2 .....77.50
Clairton,Pa. U5 .....77.50
Ensley,Ala. T2 .....77.50
Fairfield,Ala. T2 .....77.50
Fontana,Calif. K1 ....88.00
Gary,Ind. U5 .....77.50
Johnstown,Pa. B2 ....77.50
Lackawanna,N.Y. B2 ..77.50
Munhall,Pa. U5 .....77.50
S.Chicago,Ill. R2, U5 ..77.50
S.Duquesne,Pa. U5 ....77.50
Sterling,Ill. N15 .....77.50
Youngstown R2 .....77.50

Carbon, Forging (NT)

Bessemer,Pa. U5 ....$96.00
Bridgeport,Conn. N19 .101.00
Buffalo R2 .....96.00
Canton,O. R2 .....98.50
Clairton,Pa. U5 .....96.00
Conshohocken,Pa. A3 .101.00
Ensley,Ala. T2 .....96.00
Fairfield,Ala. T2 .....96.00
Fontana,Calif. K1 ....105.50
Gary,Ind. U5 .....96.00
Geneva,Utah C11 .....96.00
Houston S5 .....101.00
Johnstown,Pa. B2 ....96.00
Lackawanna,N.Y. B2 ..96.00
LosAngeles B3 .....105.50
Midland,Pa. C18 .....96.00
Munhall,Pa. U5 .....96.00
Seattle B3 .....109.50
Sharon,Pa. S3 .....96.00
S.Chicago R2,U5,W14 .96.00
S.Duquesne,Pa. U5 ....96.00
S.SanFrancisco B3 ..105.50
Warren,O. C17 .....96.00

Alloy, Forging (NT)

Bethlehem,Pa. B2 ...$114.00
Bridgeport,Conn. N19.114.00
Buffalo R2 .....114.00
Canton,O. R2, T7 ....114.00
Conshohocken,Pa. A3.121.00
Detroit S41 .....114.00
Farrell,Pa. S3 .....114.00
Fontana,Calif. K1 ....135.00
Gary,Ind. U5 .....114.00
Houston S5 .....119.00
Ind.Harbor,Ind. Y1 ...114.00
Johnstown,Pa. B2 ....114.00
Lackawanna,N.Y. B2.114.00
LosAngeles B3 .....134.00
Lowellville,O. S3 ....114.00
Massillon,O. R2 .....114.00
Midland,Pa. C18 .....114.00
Munhall,Pa. U5 .....114.00
Sharon,Pa. S3 .....114.00
S.Chicago R2,U5,W14.114.00
S.Duquesne,Pa. U5 ....114.00
Struthers,O. Y1 .....114.00
Warren,O. C17 .....114.00

ROUNDS, SEAMLESS TUBE (NT)

Bridgeport,Conn. N19 $122.50
Buffalo R2 .....117.50
Canton,O. R2 .....120.00
Cleveland,O. R2 ....117.50
Gary,Ind. U5 .....117.50
S.Chicago,Ill. R2, W14 117.50
S.Duquesne,Pa. U5 ...117.50
Warren,O. C17 .....117.50

SKELP

Aliquippa,Pa. J5 ....5.075
Munhall,Pa. U5 .....4.875
Warren,O. R2 .....4.875
Youngstown R2, U5 ...4.875

WIRE RODS

AlabamaCity,Ala. R2 ..6.15
Aliquippa,Pa. J5 .....6.15
Alton,Ill. L1 .....6.35
Buffalo W12 .....6.15
Cleveland A7 .....6.15
Donora,Pa. A7 .....6.15
Fairfield,Ala. T2 .....6.15
Houston S5 .....6.40
IndianaHarbor,Ind. Y1..6.15
Johnstown,Pa. B2 ....6.15
Joliet,Ill. A7 .....6.15
KansasCity,Mo. S5 ....6.40
Kokomo,Ind. C16 .....6.25
LosAngeles B3 .....6.95
Minnequa,Colo. C10 ...6.40
Monessen,Pa. P17 .....6.15
N.Tonawanda,N.Y. B11..6.15
Pittsburg,Calif. C11 ....6.95
Portsmouth,O. P12 ....6.15
Roebling,N.J. R5 .....6.25
S.Chicago,Ill. R2 .....6.15
SparrowsPoint,Md. B2 ..6.25
Sterling,Ill.(1) N15 ....6.15
Sterling,Ill. N15 .....6.25
Struthers,O. Y1 .....6.15
Worcester,Mass. A7 ...6.45

STRUCTURALS

Carbon Steel Std. Shapes

Ala.City,Ala. R2 ....5.275
Atlanta A11 .....5.475
Aliquippa,Pa. J5 ....5.275
Bessemer,Ala. T2 ....5.275
Bethlehem,Pa. B2 ....5.325
Birmingham C15 .....5.275
Clairton,Pa. U5 .....5.275
Fairfield,Ala. T2 .....5.275
Fontana,Calif. K1 ....6.025
Gary,Ind. U5 .....5.275
Geneva,Utah C11 .....5.275
Houston S5 .....5.375
Ind.Harbor,Ind. I-2 ..5.275
Johnstown,Pa. B2 ....5.325
Joliet,Ill. P22 .....5.275
KansasCity,Mo. S5 ....5.375
Lackawanna,N.Y. B2..5.325
LosAngeles B3 .....5.975
Minnequa,Colo. C10 ...5.575
Munhall,Pa. U5 .....5.275
Niles,Calif. P1 .....5.925
Phoenixville,Pa. P4 ....5.50
Portland,Oreg. O4 ....6.025
Seattle B3 .....6.025
S.Chicago,Ill. U5, W14 5.275
S.SanFrancisco B3 ....5.925
Sterling,Ill. N15 .....5.275
Torrance,Calif. C11 ...5.975
Weirton,W.Va. W6 ....5.275

Wide Flange

Bethlehem,Pa. B2 ....5.325
Clairton,Pa. U5 .....5.275
Fontana,Calif. K1 ....6.225
IndianaHarbor,Ind. I-2 5.525
Lackawanna,N.Y. B2 ..5.325
Munhall,Pa. U5 .....5.275
Phoenixville,Pa. P4 ....5.50
S.Chicago,Ill. U5 .....5.275

Alloy Std. Shapes

Aliquippa,Pa. J5 .....6.55
Clairton,Pa. U5 .....6.55
Gary,Ind. U5 .....6.55
Houston S5 .....6.65
KansasCity,Mo. S5 ....6.65
Munhall,Pa. U5 .....6.55
S.Chicago,Ill. U5 .....6.55

H.S., L.A. Std. Shapes

Aliquippa,Pa. J5 .....7.75
Bessemer,Ala. T2 .....7.75
Bethlehem,Pa. B2 .....7.80
Clairton,Pa. U5 .....7.75
Fairfield,Ala. T2 .....7.75
Fontana,Calif. K1 ....8.50
Gary,Ind. U5 .....7.75
Geneva,Utah C11 .....7.75
Houston S5 .....7.85
Ind.Harbor,Ind. I-2, Y1 7.75
Johnstown,Pa. B2 ....7.80
KansasCity,Mo. S5 ....7.85
Lackawanna,N.Y. B2 ..7.80
LosAngeles B3 .....8.45
Munhall,Pa. U5 .....7.75
Seattle B3 .....8.50
S.Chicago,Ill. U5, W14..7.75
S.SanFrancisco B3 ....8.40
Struthers,O. Y1 .....7.75

H.S., L.A. Wide Flange

Bethlehem,Pa. B2 .....7.80
Lackawanna,N.Y. B2 ..7.80
Munhall,Pa. U5 .....7.75
S.Chicago,Ill. U5 .....7.75

PILING

BEARING PILES

Bethlehem,Pa. B2 ....5.325
Lackawanna,N.Y. B2 .5.325
Munhall,Pa. U5 .....5.275
S.Chicago,Ill. U5 .....5.275

STEEL SHEET PILING

Lackawanna,N.Y. B2 ..6.225
Munhall,Pa. U5 .....6.225
S.Chicago,Ill. U5 .....6.225

PLATES

PLATES, Carbon Steel

Ala.City,Ala. R2 .....5.10
Aliquippa,Pa. J5 .....5.10
Ashland,Ky. (15) A10 .5.10
Bessemer,Ala. T2 .....5.10
Clairton,Pa. U5 .....5.10
Claymont,Del. C22 ....5.70
Cleveland J5, R2 .....5.20
Coatesville,Pa. L7 .....5.50
Conshohocken,Pa. A3 ..5.20
Ecorse,Mich. G5 .....5.20
Fairfield,Ala. T2 .....5.10
Fontana,Calif.(30) K1 ..5.85
Gary,Ind. U5 .....5.10
Geneva,Utah C11 .....5.10
GraniteCity,Ill. G4 ....5.30
Harrisburg,Pa. P4 .....5.80
Houston S5 .....5.20
Ind.Harbor,Ind. I-2, Y1 5.10
Johnstown,Pa. B2 .....5.10
Lackawanna,N.Y. B2 ...5.10
LoneStar,Tex. L6 .....5.45
Mansfield,O. E6 .....5.10
Minnequa,Colo. C10 ....5.95
Munhall,Pa. U5 .....5.10
Newport,Ky. A2 .....5.10
Pittsburgh J5 .....5.10
Riverdale,Ill. A1 .....5.10
Seattle B3 .....6.00
Sharon,Pa. S3 .....5.10
S.Chicago,Ill. U5, W14 5.10
SparrowsPoint,Md. B2 ..5.10
Sterling,Ill. N15 .....5.10
Steubenville,O. W10 ....5.10
Warren,O. R2 .....5.10
Youngstown R2, U5, Y1..5.10

PLATES, Carbon Abras. Resist.

Claymont,Del. C22 ....7.35
Fontana,Calif. K1 ....7.50
Geneva,Utah C11 .....6.75
Johnstown,Pa. B2 .....7.00
SparrowsPoint,Md. B2 ..7.00

PLATES, Wrought Iron

Economy,Pa. B14 ....13.15

PLATES, H.S., L.A.

Aliquippa,Pa. J5 ....7.625
Bessemer,Ala. T2 .....7.625
Clairton,Pa. U5 .....7.625
Claymont,Del. C22 ....7.625
Cleveland J5, R2 .....7.625
Coatesville,Pa. L7 ....7.925
Conshohocken,Pa. A3..7.625
Ecorse,Mich. G5 .....7.725
Fairfield,Ala. T2 .....7.625
Farrell,Pa. S3 .....7.625
Fontana,Calif.(30) K1.8.375
Gary,Ind. U5 .....7.625
Geneva,Utah C11 .....7.625
Houston S5 .....7.725
Ind.Harbor,Ind. I-2, Y1 7.625
Johnstown,Pa. B2 .....7.625
Lackawanna,N.Y. B2 ..7.625
Munhall,Pa. U5 .....7.625
Pittsburgh J5 .....7.625
Seattle B3 .....8.525
Sharon,Pa. S3 .....7.625
S.Chicago,Ill. U5, W14 7.625
SparrowsPoint,Md. B2 7.625
Warren,O. R2 .....7.625
Youngstown U5 .....7.625

PLATES, Alloy

Aliquippa,Pa. J5 .....7.20
Claymont,Del. C22 ....7.20
Coatesville,Pa. L7 .....7.20
Farrell,Pa. S3 .....7.20
Fontana,Calif.(30) K1..7.95
Gary,Ind. U5 .....7.20
Houston S5 .....7.30
Ind.Harbor,Ind. Y1 ....7.20
Johnstown,Pa. B2 .....7.20
Lowellville,O. S3 .....7.20
Munhall,Pa. U5 .....7.20
Newport,Ky. A2 .....7.20
Pittsburgh J5 .....7.20
Seattle B3 .....8.10
Sharon,Pa. S3 .....7.20
S.Chicago,Ill. U5, W14 7.20
SparrowsPoint,Md. B2 .7.20
Youngstown Y1 .....7.20

FLOOR PLATES

Cleveland J5 .....6.175
Conshohocken,Pa. A3 ..6.175
Ind.Harbor,Ind. I-2 ..6.175
Munhall,Pa. U5 .....6.175
S.Chicago,Ill. U5 .....6.175

PLATES, Ingot Iron

Ashland c.l. (15) A10..5.35
Ashland l.c.l. (15) A10..5.85
Cleveland c.l. R2 .....5.85
Warren,O. c.l. R2 .....5.85

BARS

BARS, Hot-Rolled Carbon (Merchant Quality)

Ala.City,Ala.(9) R2 ..5.425
Aliquippa,Pa.(9) J5 ....5.425
Alton,Ill. L1 .....5.625
Atlanta(9) A11 .....5.625
Bessemer,Ala.(9) T2 ..5.425
Birmingham(9) C15 ...5.425
Bridgeport,Conn.(9) N19 5.65
Buffalo(9) R2 .....5.425
Clairton,Pa.(9) U5 ....5.425
Cleveland(9) R2 .....5.425
Ecorse,Mich.(9) G5 ...5.525
Emeryville,Calif. J7 ...6.175
Fairfield,Ala.(9) T2 ..5.425
Fairless,Pa.(9) U5 ....5.575
Fontana,Calif.(9) K1 ..6.125
Gary,Ind.(9) U5 .....5.425
Houston(9) S5 .....5.675
Ind.Harbor(9) I-2, Y1 5.425
Johnstown,Pa.(9) B2 ..5.425
Joliet,Ill. P22 .....5.425
KansasCity,Mo.(9) S5 .5.675
Lackawanna(9) B2 ....5.425
LosAngeles(9) B3 .....6.125
Milton,Pa. M18 .....5.575
Minnequa,Colo. C10 ...5.875
Niles,Calif. P1 .....6.125
N.T'wanda,N.Y.(46)B11 5.775
Pittsburg,Calif.(9) C11 6.125
Pittsburgh(9) J5 .....5.425
Portland,Oreg. O4 ....6.175
Seattle B3, N14 .....6.175
S.Ch'c'go(9)R2,U5,W14 5.425
S.Duquesne,Pa.(9) U5 .5.425
S.SanFran.,Calif.(9)B3 6.175
Sterling,Ill.(1)(9) N15..5.425
Sterling,Ill.(9) N15 ...5.525
Struthers,O. Y1 .....5.425
Tonawanda,N.Y. B12 ..5.425
Torrance,Calif.(9) C11 6.125
Youngstown(9) R2, U5 5.425

BARS, H.R. Leaded Alloy (Including leaded extra)

Warren,O. C17 .....7.475

BARS, Hot-Rolled Alloy

Aliquippa,Pa. J5 .....6.475
Bethlehem,Pa. B2 ....6.475
Bridgeport,Conn. N19 ..6.55
Buffalo R2 .....6.475
Canton,O. R2, T7 ....6.475
Clairton,Pa. U5 .....6.475
Detroit S41 .....6.475
Ecorse,Mich. G5 .....6.575
Fairless,Pa. U5 .....6.625
Farrel,Pa. S3 .....6.475
Fontana,Calif. K1 ....7.525
Gary,Ind. U5 .....6.475
Houston S5 .....6.725
Ind.Harbor,Ind. I-2, Y1 6.475
Johnstown,Pa. B2 ....6.475
KansasCity,Mo. S5 ....6.725
Lackawanna,N.Y. B2 ..6.475
Lowellville,O. S3 .....6.475
LosAngeles B3 .....7.525
Massillon,O. R2 .....6.475
Midland,Pa. C18 .....6.475
Pittsburgh J5 .....6.475
Sharon,Pa. S3 .....6.475
S.Chicago R2, U5, W14 6.475
S.Duquesne,Pa. U5 ....6.475
Struthers,O. Y1 .....6.475
Warren,O. C17 .....6.475
Youngstown U5 .....6.475

BARS & SMALL SHAPES, H.R. High-Strength Low-Alloy

Aliquippa,Pa. J5 ....7.925
Bessemer,Ala. T2 ....7.925
Bethlehem,Pa. B2 ....7.925
Bridgeport,Conn. N19 ..7.95
Clairton,Pa. U5 .....7.925
Cleveland R2 .....7.925
Ecorse,Mich. G5 .....8.025
Fairfield,Ala. T2 .....7.925
Fontana,Calif. K1 ....8.625
Gary,Ind. U5 .....7.925
Houston S5 .....8.175
Ind.Harbor,Ind. Y1 ....7.925
Johnstown,Pa. B2 ....7.925
KansasCity,Mo. S5 ....8.175
Lackawanna,N.Y. B2..7.925
LosAngeles B3 .....8.625
Pittsburgh J5 .....7.925
Seattle B3 .....8.675
S.Chicago,Ill. U5, W14 7.925
S.Duquesne,Pa. U5 ....7.925
S.SanFrancisco B3 ....8.675
Struthers,O. Y1 .....7.925
Youngstown U5 .....7.925

BAR SIZE ANGLES; H.R. Carbon

Bethlehem,Pa.(9) B2 ..5.575
Houston(9) S5 .....5.675
KansasCity,Mo.(9) S5..5.675
Lackawanna(9) B2 ....5.425
Sterling,Ill. N15 .....5.525
Sterling,Ill.(1) N15 ..5.425
Tonawanda,N.Y. B12 ..5.425

BAR SIZE ANGLES; S. Shapes

Aliquippa,Pa. J5 .....5.425
Atlanta A11 .....5.625
Joliet,Ill. P22 .....5.425
Niles,Calif. P1 .....6.125
Pittsburgh J5 .....5.425
Portland,Oreg. O4 ....6.175
SanFrancisco S7 .....6.275
Seattle B3 .....6.175

BAR SHAPES, Hot-Rolled Alloy

Aliquippa,Pa. J5 .....6.55
Clairton,Pa. U5 .....6.55
Gary,Ind. U5 .....6.55
Houston S5 .....6.80
KansasCity,Mo. S5 ....6.80
Pittsburgh J5 .....6.55
Youngstown U5 .....6.55

BARS, C.F., Leaded Alloy (Including leaded extra)

Ambridge,Pa. W18 ...9.925
BeaverFalls,Pa. M12 ..9.925
Camden,N.J. P13 ... 10.10
Chicago W18 .....9.925
Cleveland C20 .....9.925
LosAngeles P2, S30
(Grade A) 11.30
(Grade B) 11.80
Monaca,Pa. S17 .....9.925
Newark,N.J. W18 ....10.10
SpringCity,Pa. K3 ....10.10
Warren,O. C17 .....9.925

BARS, Cold-Finished Carbon

Ambridge,Pa. W18 ....7.30
BeaverFalls,Pa. M12,R2 7.30
Birmingham C15 .....7.90
Bridgeport,Conn. N19 ..7.65
Buffalo B5 .....7.35
Camden,N.J. P13 .....7.75
Carnegie,Pa. C12 .....7.30
Chicago W18 .....7.30
Cleveland A7, C20 ....7.30
Detroit B5, P17 .....7.50
Detroit S41 .....7.30
Donora,Pa. A7 .....7.30
Elyria,O. W8 .....7.30
FranklinPark,Ill. N5 ..7.30
Gary,Ind. R2 .....7.30
GreenBay,Wis. F7 .....7.30
Hammond,Ind. J5, L2..7.30
Hartford,Conn. R2 .....7.80
Harvey,Ill. B5 .....7.30
LosAngeles P2, S30 ....8.75
LosAngeles R2 .....8.75
Mansfield,Mass. B5 ....7.85
Massillon,O. R2, R8 ...7.30
Midland,Pa. C18 .....7.30
Monaca,Pa. S17 .....7.30
Newark,N.J. W18 .....7.75
NewCastle,Pa.(17) B4 ..7.30
Pittsburgh J5 .....7.30
Plymouth,Mich. P5 ....7.55
Putnam,Conn. W18 ....7.85
Readville,Mass. C14 ...7.85
S.Chicago,Ill. W14 .....7.30
SpringCity,Pa. K3 .....7.75
Struthers,O. Y1 .....7.30
Warren,O. C17 .....7.30
Willimantic,Conn. J5 ...7.80
Waukegan,Ill. A7 .....7.30
Youngstown F3, Y1 ....7.30

BARS, Cold-Finished Carbon (Turned and Ground)

Cumberland,Md.(5) C19..6.55

BARS, Cold-Finished Alloy

Amoridge,Pa. W18 ...8.775
BeaverFalls,Pa. M12,R2 8.775
Bethlehem,Pa. B2 ....8.775
Bridgeport,Conn. N19..8.925
Buffalo B5 .....8.775
Camden,N.J. P13 .....8.95
Canton,O. T7 .....8.775
Carnegie,Pa. C12 .....8.775
Chicago W18 .....8.775
Cleveland A7, C20 ....8.775
Detroit B5, P17 .....8.975
Detroit S41 .....8.775
Donora,Pa. A7 .....8.775
Elyria,O. W8 .....8.775
FranklinPark,Ill. N5 ..8.775
Gary,Ind. R2 .....8.775
GreenBay,Wis. F7 ....8.775
Hammond,Ind. J5, L2..8.775
Hartford,Conn. R2 ....9.075
Harvey,Ill. B5 .....8.775
Lackawanna,N.Y. B2..8.775
LosAngeles P2, S30 ..10.65
Mansfield,Mass. B5 ...9.075
Massillon,O. R2, R8 ..8.775
Midland,Pa. C18 .....8.775
Monaca,Pa. S17 .....8.775
Newark,N.J. W18 .....8.95
Plymouth,Mich. P5 ....8.975
S.Chicago W14 .....8.775
SpringCity,Pa. K3 .....8.95
Struthers,O. Y1 .....8.775
Warren,O. C17 .....8.775
Waukegan,Ill. A7 .....8.775
Worcester,Mass. A7 ...9.075
Youngstown F3, Y1 ...8.775

BARS, Reinforcing (To Fabricators)

Ala.City,Ala. R2 .....5.425
Atlanta A11 .....5.625
Birmingham C15 .....5.425
Bridgeport,Conn. N19 ...5.65
Buffalo R2 .....5.425
Cleveland R2 .....5.425
Ecorse,Mich. G5 .....5.775
Emeryville,Calif. J7 ..6.175
Fairfield,Ala. T2 .....5.425
Fairless,Pa. U5 .....5.575
Fontana,Calif. K1 ....6.125
Ft.Worth,Tex.(4)(26)T4 5.875
Gary,Ind. U5 .....5.425
Houston S5 .....5.675
Ind.Harbor,Ind. I-2,Y1 5.425
Johnstown,Pa. B2 ....5.425
Joliet,Ill. P22 .....5.425
KansasCity,Mo. S5 ....5.675
Lackawanna,N.Y. B2 ..5.425
LosAngeles B3 .....6.125
Milton,Pa. M18 .....5.575
Minnequa,Colo. C10 ...5.875
Niles,Calif. P1 .....6.125
Pittsburg,Calif. C11 ...6.125
Pittsburgh J5 .....5.425
Portland,Oreg. O4 ....6.175
SandSprings,Okla. S5 ..5.925
Seattle B3, N14 .....6.175
S.Chicago,Ill. R2 .....5.425
S.Duquesne,Pa. U5 ....5.425
S.SanFrancisco B3 ....6.175
SparrowsPoint,Md. B2..5.425
Sterling,Ill.(1) N15 ...5.425
Sterling,Ill. N15 .....5.525
Struthers,O. Y1 .....5.425
Tonawanda,N.Y. B12 ...6.00
Torrance,Calif. C11 ....6.125
Youngstown R2, U5 ..5.425

BARS, Reinforcing (Fabricated; to Consumers)

Boston B2 .....7.65
Chicago U8 .....6.91
Cleveland U8 .....6.89
Johnstown,Pa. B2 .....7.08
KansasCity,Mo. S5 .....7.35
Lackawanna,N.Y. B2 ..6.85
Marion,O. P11 .....6.70
Newark,N.J. U8 .....7.55
Pittsburgh J5, U8 .....7.10
Seattle B3, N14 .....7.70
SparrowsPt.,Md. B2 ....7.08
Williamsport,Pa. S19 ..7.00

BARS, Wrought Iron

Economy,Pa.(S.R.)B14 14.45
Economy,Pa.(D.R.)B14 18.00
Economy(Staybolt)B14 .18.45

RAIL STEEL BARS

ChicagoHts.(3) C2, I-2 5.325
ChicagoHts.(4)(44) I-2 5.425
ChicagoHts.(4) C2 ....5.425
Ft.Worth,Tex.(26) T4..5.875
Franklin,Pa.(3) F5 ...5.325
Franklin,Pa.(4) F5 ...5.425
JerseyShore,Pa.(4) J8 ..5.30
Marion,O.(3) P11 .....5.325
Tonawanda(3) R12 ....5.325
Tonawanda(4) B12 ....6.00
Williamsport,Pa. (3)S19 5.50

SHEETS

SHEETS, Hot-Rolled Steel (18 Gage and Heavier)

Ala.City,Ala. R2 .....4.925
Allenport,Pa. P7 .....4.925
Ashland,Ky.(8) A10....4.925
Cleveland J5, R2 ....4.925
Conshohocken,Pa. A3 ..4.975
Detroit(8) M1 .....5.025
Ecorse,Mich. G5 .....5.025
Fairfield,Ala. T2 ....4.925
Fairless, Pa. U5 .....4.975
Fontana,Calif. K1 ....5.775
Gary,Ind. U5 .....4.925
Geneva,Utah C11 ....5.025
Granite City,Ill.(8) G4..5.125
Ind.Harbor,Ind. I-2, Y1 4.925
Irvin,Pa. U5 .....4.925
Lackawanna,N.Y. B2 ..4.925
Mansfield,O. E6 .....4.925
Munhall,Pa. U5 .....4.925
Newport,Ky. (8) A2 ..4.925
Niles,O. M21, S3 ....4.925
Pittsburg,Calif. C11 ..5.625
Pittsburgh J5 .....4.925
Portsmouth,O. P12 ....4.925
Riverdale,Ill. A1 .....4.925
Sharon,Pa. S3 .....4.925
S.Chicago,Ill. W14 ....4.925
SparrowsPoint,Md. B2..4.925
Steubenville,O. W10 ...4.925
Warren,O. R2 .....4.925
Weirton,W.Va. W6 ....4.925
Youngstown U5, Y1..4.925

SHEETS, H.R., (19 Ga. & Lighter)

Niles,O. M21 .....6.05

SHEETS, H.R. Alloy

Gary,Ind. U5 .....8.10
Ind.Harbor,Ind. Y1 ....8.10
Irvin,Pa. U5 .....8.10
Munhall,Pa. U5 .....8.10
Newport,Ky. A2 .....8.10
Youngstown U5, Y1 ....8.10

SHEETS, H.R. (14 Ga. & Heavier) High-Strength, Low-Alloy

Cleveland J5, R2 ....7.275
Conshohocken,Pa. A3 ..7.325
Ecorse,Mich. G5 .....7.375
Fairfield,Ala. T2 ....7.275
Fairless,Pa. U5 .....7.325
Farrell,Pa. S3 .....7.275
Fontana,Calif. K1 ....8.125
Gary,Ind. U5 .....7.275
Ind.Harbor,Ind. I-2,Y1 7.275
Irvin,Pa. U5 .....7.275
Lackawanna(35) B2 ..7.275
Munhall,Pa. U5 .....7.275
Pittsburgh J5 .....7.275
S.Chicago,Ill. U5,W14 7.275
Sharon,Pa. S3 .....7.275
SparrowsPoint(36) B2..7.275
Warren,O. R2 .....7.275
Weirton,W.Va. W6 ....7.275
Youngstown U5, Y1 ..7.275

SHEETS, Hot-Rolled Ingot Iron (18 Gage and Heavier)

Ashland,Ky.(8) A10 ..5.175
Cleveland R2 .....5.675
Warren,O. R2 .....5.675

SHEETS, Cold-Rolled Ingot Iron

Cleveland R2 .....6.80
Middletown,O. A10 ....6.55
Warren,O. R2 .....6.80

SHEETS, Cold-Rolled Steel (Commercial Quality)

Allenport,Pa. P7 .....6.05
Cleveland J5, R2 .....6.05
Conshohocken,Pa. A3 ..6.10
Detroit M1 .....6.05
Ecorse,Mich. G5 .....6.15
Fairfield,Ala. T2 .....6.05
Fairless,Pa. U5 .....6.10
Follansbee,W.Va. F4 ...6.05
Fontana,Calif. K1 ....7.30
Gary,Ind. U5 .....6.05
GraniteCity,Ill. G4 ....6.25
Ind.Harbor,Ind. I-2, Y1 6.05
Irvin,Pa. U5 .....6.05
Lackawanna,N.Y. B2 ..6.05
Mansfield,O. E6 .....6.05
Middletown,O. A10 ....6.05
Newport,Ky. A2 .....6.05
Pittsburg,Calif. C11 ....7.00
Pittsburgh J5 .....6.05
Portsmouth,O. P12 ....6.05
SparrowsPoint,Md. B2 ..6.05
Steubenville,O. W10 ....6.05
Warren,O. R2 .....6.05
Weirton,W.Va. W6 .....6.05
Yorkville,O. W10 .....6.05
Youngstown Y1 .....6.05

SHEETS, Cold-Rolled High-Strength, Low-Alloy

Cleveland J5, R2 ....8.975
Ecorse Mich. G5 .....9.075
Fairless,Pa. U5 .....9.025
Fontana,Calif. K1 ....10.275
Gary,Ind. U5 .....8.975
IndianaHarbor,Ind. Y1 8.975
Irvin,Pa. U5 .....8.975
Lackawanna(37) B2 ..8.975
Pittsburgh J5 .....8.975
SparrowsPoint(38) B2 8.975
Warren,O. R2 .....8.975
Weirton,W.Va. W6 ....8.975
Youngstown Y1 .....8.975

SHEETS, Culvert	Cu Steel	Cu Fe
Ashland,Ky. A10	6.95	7.20
Canton,O. R2	6.95	7.45
Fairfield T2	6.95	7.20
Gary,Ind. U5	6.95	7.20
GraniteCity,Ill. G4	7.15	...
Ind.Harbor I-2	6.95	7.20
Irvin,Pa. U5	6.95	7.20
Kokomo,Ind. C16	7.05	...
MartinsFry. W10	6.95	7.20
Pittsburgh J5	6.95	...
Pitts.,Calif. C11	7.70	...
SparrowsPt. B2	6.95	...

SHEETS, Culvert—Pure Iron

Ind.Harbor,Ind. I-2 .. 7.20

SHEETS, Galvanized Steel Hot-Dipped

Ala.City,Ala. R2 .....6.60‡
Ashland,Ky. A10 ....6.60†
Canton,O. R2 .....6.60‡
Dover,O. R1 .....6.60†
Fairfield,Ala. T2 .....6.60†
Gary,Ind. U5 .....6.60*
GraniteCity,Ill. G4 ....6.80*
Ind.Harbor,Ind. I-2 ...6.60†
Irvin,Pa. U5 .....6.60*
Kokomo,Ind. C16 .....6.70‡
MartinsFerry,O. W10 ..6.60*
Middletown,O. A10 ...6.60†
Pittsburg,Calif. C11 ..7.35*
Pittsburgh J5 .....6.60†
SparrowsPt.,Md. B2 ...6.60†
Warren,O. R2 .....6.60†
Weirton,W.Va. W6 ....6.60*

*Continuous and noncontinuous. †Continuous. ‡Noncontinuous.

SHEETS, Well Casing

Fontana,Calif. K1 ....7.275

SHEETS, Galvanized High-Strength, Low-Alloy

Irvin,Pa. U5 ..... 9.725
SparrowsPt.(39) B2 ...9.725

SHEETS, Galvannealed Steel

Canton,O. R2 .....7.00
Irvin,Pa. U5 .....7.00

SHEETS, Galvanized Ingot Iron (Hot-Dipped Continuous)

Ashland,Ky. A10 .....6.85
Middletown,O. A10 ....6.85

SHEETS, Electrogalvanized

Cleveland(28) R2 .....7.425
Niles O.(28) R2 .....7.425
Weirton,W.Va. W6 ...7.275

SHEETS, Aluminum Coated

Butler,Pa. A10 (type 1).9.25
Butler,Pa. A10 (type 2).9.35

SHEETS, Enameling Iron

Ashland,Ky. A10 .....6.625
Cleveland R2 .....6.625
Gary,Ind. U5 .....6.625
GraniteCity,Ill. G4 ....6.825
Ind.Harbor,Ind. I-2,Y1 6.625
Irvin,Pa. U5 .....6.625
Middletown,O. A10 ....6.625
Niles,O. M21, S3 .....6.625
Youngstown Y1 .....6.625

BLUED STOCK, 29 Gage

Follansbee,W.Va. F4 ...8.65
Ind.Harbor,Ind. I-2 ...8.475
Yorkville,O. W10 .....8.475

SHEETS, Long Terne Steel (Commercial Quality)

BeechBottom W.Va.W10 7.00
Gary,Ind. U5 .....7.00
Mansfield,O. E6 .....7.00
Middletown O. A10 ....7.00
Niles,O. M21, S3 .....7.00
Warren,O. R2 .....7.00
Weirton,W.Va. W6 ....7.00

SHEETS, Long Terne, Ingot Iron

Middletown,O. A10 .....7.40

Key to Producers

A1 Acme Steel Co.
A2 Acme-Newport Steel Co.
A3 Alan Wood Steel Co.
A4 Allegheny Ludlum Steel
A5 Alloy Metal Wire Div., H. K. Porter Co. Inc.
A6 American Shim Steel Co.
A7 American Steel & Wire Div., U. S. Steel Corp.
A8 Anchor Drawn Steel Co.
A9 Angell Nail & Chaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.

B1 Babcock & Wilcox Co.
B2 Bethlehem Steel Co.
B3 Beth. Pac. Coast Steel
B4 Blair Strip Steel Co.
B5 Bliss & Laughlin Inc.
B8 Braeburn Alloy Steel
B9 Brainard Steel Div., Sharon Steel Corp.
B10 E. & G. Brooke, Wickwire Spencer Steel Div., Colo. Fuel & Iron
B11 Buffalo Bolt Co., Div., Buffalo-Eclipse Corp.
B12 Buffalo Steel Corp.
B14 A. M. Byers Co.
B15 J. Bishop & Co.

C1 Calstrip Steel Corp.
C2 Calumet Steel Div., Borg-Warner Corp.
C4 Carpenter Steel Co.
C7 Cleve. Cold Rolling Mills
C9 Colonial Steel Co.
C10 Colorado Fuel & Iron
C11 Columbia-Geneva Steel
C12 Columbia Steel & Shaft.
C13 Columbia Tool Steel Co.
C14 Compressed Steel Shaft.
C15 Connors Steel Div., H. K. Porter Co. Inc.
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire
C22 Claymont Steel Products Dept. Wickwire Spencer Steel Division
C23 Charter Wire Inc.
C24 G. O. Carlson Inc.

D2 Detroit Steel Corp.
D3 Dearborn Division Sharon Steel Corp.
D4 Disston Division, H. K. Porter Co. Inc.
D6 Driver-Harris Co.
D7 Dickson Weatherproof Nail Co.
D8 Damascus Tube Co.
D9 Wilbur B. Driver Co.

E1 EasternGas&FuelAssoc.
E2 Eastern Stainless Steel
E4 Electro Metallurgical Co.
E5 Elliott Bros. Steel Co.
E6 Empire Steel Corp.

F2 Firth Sterling Inc.
F3 Fitzsimmons Steel Co.
F4 Follansbee Steel Corp.
F5 Franklin Steel Div., Borg-Warner Corp.
F6 Fretz-Moon Tube Co.
F7 Ft. Howard Steel & Wire
F8 Ft. Wayne Metals Inc.

G4 Granite City Steel Co.
G5 Great Lakes Steel Corp.
G6 Greer Steel Co.
G8 Green River Steel Corp.

H1 Hanna Furnace Corp.
H7 Helical Tube Co.

I-1 Igoe Bros. Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Corp.
I-4 Ingersoll Steel Div., Borg-Warner Corp.,
I-6 Ivins, E., Steel Tube
I-7 Indiana Steel & Wire Co.

J1 Jackson Iron & Steel Co.
J3 Jessop Steel Co.
J4 Johnson Steel & Wire Co.
J5 Jones & Laughlin Steel
J6 Joslyn Mfg. & Supply
J7 Judson Steel Corp.
J8 Jersey Shore Steel Co.

K1 Kaiser Steel Corp.
K2 Keokuk Electro-Metals
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire
K7 Kenmore Metals Corp.

L1 Laclede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Steel Co.
L6 Lone Star Steel Co.
L7 Lukens Steel Co.

M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M6 Mercer Pipe Div., Sawhill Tubular Products
M8 Mid-States Steel & Wire
M12 Moltrup Steel Products
M14 McInnes Steel Co.
M16 Md. Fine & Special. Wire
M17 Metal Forming Corp.
M18 Milton Steel Division, Merritt-Chapman&Scott
M21 Mallory-Sharon Titanium Corp.
M22 Mill Strip Products Co.

N1 National Standard Co.
N2 National Supply Co.
N3 National Tube Div., U. S. Steel Corp.
N5 Nelsen Steel & Wire Co.
N6 New England High Carbon Wire Co.
N8 Newman-Crosby Steel
N9 Newport Steel Corp.
N14 Northwest.SteelRoll.Mill
N15 Northwestern S.&.W. Co.
N19 Northeastern Steel Corp.

O4 Oregon Steel Mills

P1 Pacific States Steel Corp.
P2 Pacific Tube Co.
P4 Phoenix Iron & Steel Co., Sub. of Barium Steel Corp.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Coke & Chem.
P7 Pittsburgh Steel Co.
P11 Pollak Steel Co.
P12 Portsmouth Division, Detroit Steel Corp.
P13 Precision Drawn Steel
P14 Pitts. Screw & Bolt Co.
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div., Amer. Chain & Cable
P17 Plymouth Steel Co.
P19 Pitts. Rolling Mills
P20 Prod. Steel Strip Corp.
P22 Phoenix Mfg. Co.
P24 Phil. Steel & Wire Corp.

R1 Reeves Steel & Mfg. Co.
R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons. John A.
R6 Rome Strip Steel Co.
R8 Reliance Div.,EatonMfg.
R9 Rome Mfg. Co.
R10 Rodney Metals Inc.

S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S4 Sharon Tube Co.
S5 Sheffield Steel Div., Armco Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S12 Spencer Wire Corp.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S17 Superior Drawn Steel Co.
S18 Superior Steel Corp.
S19 Sweet's Steel Co.
S20 Southern States Steel
S23 Superior Tube Co.
S25 Stainless Welded Prod.
S26 Specialty Wire Co. Inc.
S30 Sierra Drawn Steel Corp.
S40 Seneca Steel Service
S41 Stainless Steel Div., J&L Steel Corp.

T2 Tenn. Coal & Iron Div., U. S. Steel Corp.
T3 Tenn. Prod. & Chem.
T4 Texas Steel Co.
T5 Thomas Strip Division, Pittsburgh Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div., Am. Rad. & Stan. San.
T13 Tube Methods Inc.
T19 Techalloy Co. Inc.

U4 Universal-Cyclops Steel
U5 United States Steel Corp.
U6 U. S. Pipe & Foundry
U7 Ulbrich Stainless Steels
U8 U. S. Steel Supply Div., U. S. Steel Corp.

V2 Vanadium-Alloys Steel
V3 Vulcan Crucible Div., H. K. Porter Co. Inc.

W1 Wallace Barnes Co.
W2 Wallingford Steel Co.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W8 Western Automatic Machine Screw Co.
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Div., International Harvester
W15 Woodward Iron Co.
W18 Wyckoff Steel Co.

Y1 Youngstown Sheet&Tube

STRIP

STRIP, Hot-Rolled Carbon

Ala.City,Ala.(27) R2 ..4.925
Allenport,Pa. P7 .....4.925
Alton,Ill. L1 .....5.125
Ashland,Ky.(8) A10 ...4.925
Atlanta A11 .....5.125
Bessemer,Ala. T2 .....4.925
Birmingham C15 .....4.925
Buffalo(27) R2 .....4.925
Conshohocken,Pa. A3 ..4.975
Detroit M1 .....5.025
Ecorse,Mich. G5 .....5.025
Fairfield,Ala. T2 .....4.925
Fontana,Calif. K1 ....5.775
Gary,Ind. U5 .....4.925
Ind.Harbor,Ind. I-2, Y1 4.925
Johnstown,Pa.(25) B2..4.925
Lackaw'na,N.Y.(25) B2 4.925
LosAngeles(25) B3 ....5.675
Minnequa,Colo. C10 ...6.025
Pittsburg,Calif. C11 ..5.675
Riverdale,Ill. A1 .....4.925
SanFrancisco S7 .....6.35
Seattle(25) B3 .....6.35
Seattle N14 .....6.35
Sharon,Pa. S3 .....4.925
S.SanFrancisco(25) B3..5.675
SparrowsPoint,Md. B2..4.925
Sterling,Ill.(1) N15 ....4.925
Sterling,Ill. N15 .....5.025
Torrance,Calif. C11 ...5.675
Warren,O. R2 .....4.925
Weirton,W.Va. W6 ....4.925
Youngstown U5 .....4.925

STRIP, Hot-Rolled Alloy

Carnegie,Pa. S18 .....8.10
Farrell,Pa. S3 .....8.10
Gary,Ind. U5 .....8.10
Houston S5 .....8.35
Ind.Harbor,Ind. Y1 ....8.10
KansasCity,Mo. S5 ....8.35
LosAngeles B3 .....9.30
Lowellville,O. S3 .....8.10
Newport,Ky. A2 .....8.10
Sharon,Pa. S3 .....8.10
S.Chicago,Ill. W14 ....8.10
Youngstown U5, Y1 ....8.10

STRIP, Hot-Rolled High-Strength, Low-Alloy

Bessemer,Ala. T2 .....7.325
Conshohocken,Pa. A3 ..7.325
Ecorse,Mich. G5 .....7.425
Fairfield,Ala. T2 .....7.325
Farrell,Pa. S3 .....7.325
Gary,Ind. U5 .....7.325
Ind.Harbor,Ind. I-2, Y1 7.325
Lackawanna,N.Y. B2 ..7.325
LosAngeles(25) B3 ....8.075
Seattle(25) B3 .....8.325
Sharon,Pa. S3 .....7.325
S.Chicago,Ill. W14 ....7.325
S.SanFrancisco(25) B3..8.075
SparrowsPoint,Md. B2. 7.325
Warren,O. R2 .....7.325
Weirton,W.Va. W6 ....7.325
Youngstown U5, Y1 ...7.325

Strip, Hot-Rolled Ingot Iron

Ashland,Ky.(8) A10 ..5.175
Warren,O. R2 .....5.675

STRIP, Cold-Rolled Carbon

Anderson,Ind. G6 .....7.15
Baltimore T6 .....7.15
Boston T6 .....7.70
Buffalo S40 .....7.15
Cleveland A7, J5 .....7.15
Conshohocken,Pa. A3 ..7.20
Dearborn,Mich. D3 ....7.25
Detroit D2, M1, P20....7.25
Dover,O. G6 .....7.15
Ecorse,Mich. G5 .....7.25
Evanston,Ill. M22 .....7.25
Follansbee,W.Va. F4 ...7.15
Fontana,Calif. K1 .....9.00
FranklinPark,Ill. T6 ...7.25
Ind.Harbor,Ind. Y1 ....7.15
Indianapolis J5 .....7.30
LosAngeles C1 .....9.20
NewBedford,Mass. R10 .7.60
NewBritain(10) S15 ....7.15
NewCastle,Pa. B4, E5 ..7.15
NewHaven,Conn. D2 ....7.60
NewKensington,Pa. A6..7.15
Pawtucket,R.I. R3 .....7.80
Pawtucket,R.I. N8 .....7.70
Philadelphia(45) P24 ...7.70
Pittsburgh J5 .....7.15
Riverdale,Ill. A1 .....7.25
Rome,N.Y.(32) R6 .....7.15
Sharon,Pa. S3 .....7.15
Trenton,N.J.(31) R5 ....8.60
Wallingford,Conn. W2 ..7.60
Warren,O. R2, T5 .....7.15
Weirton,W.Va. W6 .....7.15
Worcester,Mass. A7 ....7.70
Youngstown J5, Y1 ....7.15

STRIP, Cold-Rolled Alloy

Boston T6 .....15.40
Carnegie,Pa. S18 .....15.05
Cleveland A7 .....15.25
Dover,O. G6 .....15.05
Farrell,Pa. S3 .....15.05
FranklinPark,Ill. T6 ..15.05
Harrison,N.J. C18 .....15.05
Indianapolis J5 .....15.20
Lowellville,O. S3 .....15.05
Pawtucket,R.I. N8 .....15.40
Riverdale,Ill. A1 .....15.05
Sharon,Pa. S3 .....15.05
Worcester,Mass. A7 ...15.55
Youngstown J5 .....15.05

STRIP, Cold-Rolled High-Strength, Low-Alloy

Cleveland A7 .....10.45
Dearborn,Mich. D3 ....10.60
Dover,O. G6 .....10.45
Ecorse,Mich. G5 .....10.55
Farrell,Pa. S3 .....10.50
Ind.Harbor,Ind. Y1 ....10.65
Sharon,Pa. S3 .....10.50
Warren,O. R2 .....10.45

STRIP, Cold-Finished	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Spring Steel (Annealed)					
Baltimore T6	9.50	10.70	12.90	15.90	18.85
Boston T6	9.50	10.70	12.90	15.90	18.85
Bristol,Conn. W1	...	10.70	12.90	16.10	19.30
Carnegie,Pa. S18	8.95	10.40	12.60	15.60	....
Cleveland A7	8.95	10.40	12.60	15.60	18.55
Dearborn,Mich. D3	9.05	10.50	12.70	....	....
Detroit D2	9.05	10.50	12.70	15.70	....
Dover,O. G6	8.95	10.40	12.60	15.60	18.55
Evanston,Ill. M22	8.95	10.40	12.60	....	....
Fostoria,O. S1	10.05	11.15	13.10	16.10	....
FranklinPark,Ill. T6	9.05	10.40	12.60	15.60	18.55
Harrison,N.J. C18	...	....	12.90	16.10	19.30
Indianapolis J5	9.10	10.55	12.60	15.60	18.55
LosAngeles C1	11.15	12.60	14.80	17.80	....
NewBritain,Conn.(10) S15	8.95	10.40	12.60	15.60	18.55
NewCastle,Pa. B4, E5	8.95	10.40	12.60	15.60	....
NewHaven,Conn. D2	9.40	10.70	12.90	15.90	....
NewKensington,Pa. A6	8.95	10.40	12.60	15.60	....
NewYork W3	...	10.70	12.90	16.10	19.30
Pawtucket,R.I. N8	9.50	10.70	12.90	15.90	18.85
Riverdale,Ill. A1	9.05	10.40	12.60	15.60	18.55
Rome,N.Y.(32) R6	8.95	10.40	12.60	15.60	18.55
Sharon,Pa. S3	8.95	10.40	12.60	15.60	18.55
Trenton,N.J. R5	...	10.70	12.90	16.10	19.30
Wallingford,Conn. W2	9.40	10.70	12.90	15.90	18.75
Warren,O. T5	8.95	10.40	12.60	15.60	18.55
Worcester,Mass. A7, T6..	9.50	10.70	12.90	15.90	18.85
Youngstown J5	8.95	10.40	12.60	15.60	18.55

Spring Steel (Tempered)			Up to 0.80C	0.81-1.05C	1.06-1.35C
Bristol,Conn. W1	...	...	18.10	21.95	26.30
Buffalo W12	...	...	18.10	....	....
Fostoria,O. S1	...	...	18.30	22.15	....
FranklinPark,Ill. T6	...	...	18.45	22.30	26.65
Harrison,N.J. C18	...	...	18.10	21.95	26.30
NewYork W3	...	...	18.10	21.95	26.30
Palmer,Mass. W12	...	...	18.10	....	....
Trenton,N.J. R5	...	...	18.10	21.95	26.30
Worcester,Mass. A7, T6..	...	...	18.10	21.95	26.30
Youngstown J5	...	...	18.45	22.30	26.65

SILICON STEEL

H.R. SHEETS(22 Ga.,cut lengths)	Field	Armature	Electric	Motor	Dynamo
BeechBottom,W.Va. W10	....	....	11.80	12.90	13.95
Mansfield O. E6	9.625	11.10	11.80	12.90	13.95
Newport,Ky. A2	9.625	11.10	11.80	12.90	13.95
Niles,O. M21, S3	9.625	11.10	11.80	12.90	....
Vandergrift,Pa. U5	....	11.10	11.80	12.90	13.95
Warren,O. R2	9.625	11.10	11.80	12.90	....
Zanesville,O. A10	....	11.10	11.80	12.90	13.95
Zanesville,O. A10 (SP coils)	....	....	11.55	12.65	13.70

C.R. COILS & CUT LENGTHS (22 Ga.)

Fully Processed (Semiprocessed 1½c lower)	Field	Armature	Electric	Motor	Dynamo
BeechBottom,W.Va. W10.	....	11.35	12.05	13.15	14.20
Brackenridge Pa. A4	....	....	12.05	13.15	14.20
GraniteCity,Ill. G4	9.825*	11.05*	11.75*	12.85*	....
IndianaHarbor,Ind. I-2	9.625†	10.85*	11.55*	12.65*	....
Mansfield,O. E6	9.625*	11.35	12.05	13.50	14.20
Vandergrift,Pa. U5	9.625*	11.35	12.05	13.15	14.20
Warren,O. R2	9.625*	11.35	12.05	13.15	14.20
Zanesville,O. A10 (FP coils)	...	11.35	12.05	13.15	14.20

H.R. SHEETS (22 Ga., cut lengths)	Transformer Grades T-72	T-65	T-58	T-52
BeechBottom,W.Va. W10	15.00	15.55	16.05	17.10
Vandergrift,Pa. U5	14.75	15.55	16.05	17.10
Zanesville,O. A10	15.00	15.55	16.05	17.10

C.R. COILS & CUT LENGTHS (22 Ga.)	Grain Oriented T-100	T-90	T-80	T-73	T-66	T-72
Brackenridge,Pa. A4.	....	17.60	19.20	19.70	20.20	....
Butler,Pa. A10	....	....	19.20	19.70	20.20	....
Vandergrift,Pa. U5	16.60	17.60	19.20	19.70	20.20	15.25**
Warren,O. R2	....	....	....	....	....	15.25‡

*Semiprocessed. †Fully processed only. ‡Coils, annealed, semiprocessed ½c lower. **Cut lengths, ¾-cent lower.

Weirton,W.Va. W6 ...10.45
Youngstown Y1 .....10.65

STRIP, Cold-Rolled Ingot Iron

Warren,O. R2 .....7.90

STRIP, C.R. Electrogalvanized

Cleveland A7 .....7.15*
Dover,O. G6 .....7.15*
Evanston,Ill. M22 .....7.25*
Riverdale,Ill. A1 .....7.25*
Warren,O. B9, T5 .....7.15*
Worcester,Mass. A7 ...7.70*
Youngstown J5 .....7.15*

*Plus galvanizing extras.

STRIP, Galvanized (Continuous)

Sharon,Pa. S3 .....7.275

TIGHT COOPERAGE HOOP

Atlanta A11 .....5.65
Riverdale,Ill. A1 .....5.50
Sharon,Pa. S3 .....5.35
Youngstown U5 .....5.35

TIN MILL PRODUCTS

TIN PLATE, Electrolytic (Base Box)	0.25 lb	0.50 lb	0.75 lb
Aliquippa,Pa. J5	$8.75	$9.00	$9.40
Fairfield,Ala. T2	8.85	9.10	9.50
Fairless,Pa. U5	8.85	9.10	9.50
Fontana,Calif. K1	9.50	9.75	10.15
Gary,Ind. U5	8.75	9.00	9.40
GraniteCity,Ill. G4	8.85	9.10	9.50
IndianaHarbor,Ind. I-2, Y1	8.75	9.00	9.40
Irvin,Pa. U5	8.75	9.00	9.40
Niles,O. R2	8.75	9.00	9.40
Pittsburg,Calif. C11	9.50	9.75	10.15
SparrowsPoint,Md. B2	8.85	9.10	9.50
Weirton,W.Va. W6	8.75	9.00	9.40
Yorkville,O. W10	8.75	9.00	9.40

ELECTROTIN (22-27 Gage; Dollars per 100 lb)			
Aliquippa,Pa. J5	7.725	7.925	....
Niles,O. R2	7.725	7.925	8.125

TINPLATE, American	1.25 lb	1.50 lb
Aliquippa,Pa.J5	$10.05	$10.30
Fairfield,Ala.T2,	10.15	10.40
Fairless,Pa. U5 .	10.15	10.40
Fontana,Calif.K1	10.80	11.05
Gary,Ind. U5 ...	10.05	10.30
Irvin,Pa. U5 ...	10.05	10.30
Pitts.,Calif. C11.	10.80	11.05
Sp.Pt.,Md. B2 ..	10.15	10.40
Weirton,W.Va.W6	10.05	10.30
Yorkville,O. W10	10.05	10.30

BLACK PLATE (Base Box)

Aliquippa,Pa. J5 .....$7.85
Fairfield,Ala. T2 .....7.95
Fairless,Pa. U5 .....7.95
Fontana,Calif. K1 .....8.60
Gary,Ind. U5 .....7.85
GraniteCity,Ill. G4 .....7.95
Ind.Harbor,Ind. I-2, Y1 7.85
Irvin,Pa. U5 .....7.85
Niles,O. R2 .....7.85
Pittsburg,Calif. C11 ....8.60
SparrowsPoint,Md. B2 ..7.95
Weirton,W.Va. W6 .....7.85
Yorkville,O. W10 .....7.85

HOLLOWARE ENAMELING Black Plate (29 Gage)

Aliquippa,Pa. J5 .....$7.50
Gary,Ind. U5 .....7.50
GraniteCity,Ill. G4 .....7.60
Ind.Harbor,Ind. Y1 ....7.50
Irvin,Pa. U5 .....7.50
Yorkville,O. W10 .....7.50

MANUFACTURING TERNES (Special Coated, Base Box)

Gary,Ind. U5 .....$9.70
Irvin,Pa. U5 .....9.70

ROOFING SHORT TERNES (8 lb Coated, Base Box)

Gary,Ind. U5 .....$11.25

WIRE

WIRE, Manufacturers Bright, Low Carbon

AlabamaCity,Ala. R2 ..7.65
Aliquippa,Pa. J5 .....7.65
Alton,Ill. L1 .....7.85
Atlanta A11 .....7.85
Bartonville,Ill. K4 .....7.75
Buffalo W12 .....7.65
Chicago W13 .....7.65
Cleveland A7, C20 .....7.65
Crawfordsville,Ind. M8..7.75
Donora,Pa. A7 .....7.65
Duluth A7 .....7.65
Fairfield,Ala. T2 .....7.65
Fostoria,O.(24) S1 .....7.75
Houston S5 .....7.90
Jacksonville,Fla. M8 ...8.00
Johnstown,Pa. B2 .....7.65
Joliet,Ill. A7 .....7.65
KansasCity,Mo. S5 .....7.90
Kokomo,Ind. C16 .....7.75
LosAngeles B3 .....8.60
Minnequa,Colo. C10 ....7.90
Monessen,Pa. P7, P16...7.65
N.Tonawanda,N.Y. B11..7.65
Palmer,Mass. W12 .....7.95
Pittsburg,Calif. C11 ....8.60
Portsmouth,O. P12 .....7.65
Rankin,Pa. A7 .....7.65
S.Chicago,Ill. R2 .....7.65
S.SanFrancisco C10 ....8.60
SparrowsPoint,Md. B2 ..7.75
Sterling,Ill.(1) N15 ....7.65
Sterling,Ill. N15 .....7.75
Struthers,O. Y1 .....7.65
Waukegan,Ill. A7 .....7.65
Worcester,Mass. A7 ....7.95

WIRE, Gal'd ACSR for Cores

Bartonville,Ill. K4 .....12.65
Buffalo W12 .....12.65
Cleveland A7 .....12.65
Donora,Pa. A7 .....12.65
Duluth A7 .....12.65
Johnstown,Pa. B2 .....12.65
Minnequa,Colo. C10 ...12.775
Monessen,Pa. P16 .....12.65
Muncie,Ind. I-7 .....12.85
NewHaven,Conn. A7 ....12.95
Palmer,Mass. W12 .....12.95
Pittsburg,Calif. C11 ....13.45
Portsmouth,O. P12 .....12.65
Roebling,N.J. R5 .....12.95
SparrowsPt.,Md. B2 ....12.75
Struthers,O. Y1 .....12.65
Trenton,N.J. A7 .....12.95
Waukegan,Ill. A7 .....12.65
Worcester,Mass. A7 ....12.95

WIRE, Upholstery Spring

Aliquipna,Pa. J5 .....9.30
Alton,Ill. L1 .....9.50
Buffalo W12 .....9.30
Cleveland A7 .....9.30
Donora,Pa. A7 .....9.30
Duluth A7 .....9.30
Johnstown,Pa. B2 .....9.30
KansasCity,Mo. S5 .....9.55
LosAngeles B3 .....10.25
Minnequa,Colo. C10 ....9.50
Monessen,Pa. P7, P16...9.30
NewHaven,Conn. A7 ....9.60
Palmer,Mass. W12 .....9.60
Pittsburg,Calif. C11 ..10.25
Portsmouth,O. P12 ....9.30
Roebling,N.J. R5 .....9.60
S.Chicago,Ill. R2 .....9.30
S.SanFrancisco C10 ...10.25
SparrowsPt.,Md. B2 ....9.40
Struthers,O. Y1 .....9.30
Trenton,N.J. A7 .....9.60
Waukegan,Ill. A7 .....9.30
Worcester,Mass. A7 ....9.60

WIRE, MB Spring, High Carbon

Aliquippa,Pa. J5 .....9.30
Alton,Ill. L1 .....9.50
Bartonville,Ill. K4 .....9.40
Buffalo W12 .....9.30
Cleveland A7 .....9.30
Donora,Pa. A7 .....9.30
Duluth A7 .....9.30
Fostoria,O. S1 .....9.35
Johnstown,Pa. B2 .....9.30
KansasCity,Mo. S5 ....9.55
LosAngeles B3 .....10.25
Milbury,Mass.(12) N8...9.60
Minnequa,Colo. C10 ....9.55
Monessen,Pa. P7, P16..9.30
Muncie,Ind. I-7 .....9.50
Palmer,Mass.(12) W12 ..9.60
Pittsburg,Calif. C11 ...10.25
Portsmouth, O. P12 ....9.30
Roebling,N.J. R5 .....9.60
S.Chicago,Ill. R2 .....9.30
S.SanFrancisco C10 ...10.25
SparrowsPt.,Md. B2 ....9.40
Struthers,O. Y1 .....9.30
Trenton,N.J. A7 .....9.60
Waukegan,Ill. A7 .....9.60
Worcester, A7, J4, T6...9.60

WIRE, Fine & Weaving(8" Coils)

Alton,Ill. L1 .....15.80
Bartonville,Ill. K4 ....15.70
Buffalo W12 .....15.60
Chicago W13 .....15.60
Cleveland A7 .....15.60
Crawfordsville,Ind. M8.15.70
Fostoria,O. S1 .....15.60
Houston S5 .....15.85
Jacksonville,Fla. M8 ..15.95
Johnstown,Pa. B2 .....15.60
KansasCity,Mo. S5 ....15.85
Kokomo,Ind. C16 .....15.60
Minnequa,Colo. C10 ...15.85
Monessen,Pa. P7, P16..15.60
Muncie,Ind. I-7 .....15.80
Palmer,Mass. W12 .....15.90
S.SanFrancisco C10 ...16.45
Waukegan,Ill. A7 .....15.60
Worcester,Mass. A7, T6.15.90

ROPE WIRE

Bartonville Ill. K4 ....12.75
Buffalo W12 .....12.75
Fostoria,O. S1 .....12.75
Johnstown,Pa. B2 .....12.75
Monessen,Pa. P7 .....12.75
Muncie,Ind. I-7 .....12.95
Palmer,Mass. W12 .....13.05
Portsmouth,O. P12 ....12.75
Roebling,N.J. R5 .....13.05
SparrowsPt.,Md. B2 ....12.85
Struthers,O. Y1 .....12.75
Worcester,Mass. J4 ....13.05
(A) Plow and Mild Plow; add 0.25c for Improved Plow

WIRE, Tire Bead

Bartonville,Ill. K4	....16.55
Monessen,Pa. P16	....16.55
Roebling,N.J. R5	.....17.05

WIRE, Cold-Rolled Flat

Anderson,Ind. G6	....11.65
Baltimore T6	.....11.95
Boston T6	.....11.95
Buffalo W12	.....11.65
Chicago W13	.....11.75
Cleveland A7	.....11.65
Crawfordsville,Ind. M8	11.65
Dover,O. G6	.....11.65
Fostoria,O. S1	.....11.95
FranklinPark,Ill. T6	..11.75
Kokomo,Ind. C16	.....11.65
Massillon,O. R8	.....11.65
Milwaukee C23	.....11.85
Monessen,Pa. P7, P16	11.65
Palmer,Mass. W12	....11.95
Pawtucket,R.I. N8	....11.95
Philadelphia P24	.....11.95
Riverdale,Ill. A1	.....11.75
Rome,N.Y. R6	.....11.65
Sharon,Pa. S3	.....11.65
Trenton,N.J. R5	.....11.95
Warren,O. B9	.....11.65
Worcester,Mass. A7, T6	11.95

NAILS, Stock **Col.**

AlabamaCity,Ala. R2	...173
Aliquippa,Pa. J5	173
Atlanta A11	175
Bartonville,Ill. K4	175
Chicago W13	173
Cleveland A9	173
Crawfordsville,Ind. M8	..175
Donora,Pa. A7	173
Duluth A7	173
Houston,Tex. S5	178
Fairfield,Ala. T2	173
Jacksonville,Fla.(20) M8	.184
Joliet,Ill. A7	173
Johnstown,Pa. B2	173
KansasCity,Mo. S5	178
Kokomo,Ind. C16	175
Minnequa,Colo. C10	178
Monessen,Pa. P7	173
Pittsburg,Calif. C11	192
Rankin,Pa. A7	173
S.Chicago,Ill. R2	173
SparrowsPt.,Md. B2	175
Sterling,Ill.(7) N15	175
Worcester,Mass. A7	179

(To Wholesalers; per cwt)

Galveston,Tex. D7	....$8.95

NAILS, Cut (100 lb keg)
To Dealers (33)

Conshohocken,Pa. A3	..$9.80
Wheeling,W.Va. W10	..9.80

POLISHED STAPLES **Col.**

AlabamaCity,Ala. R2	175
Aliquippa,Pa. J5	175
Atlanta A11	177
Bartonville,Ill. K4	177
Crawfordsville,Ind. M8	..177
Donora,Pa. A7	175
Duluth A7	175
Fairfield,Ala. T2	175
Jacksonville,Fla.(20) M8	.186
Joliet,Ill. A7	175
Johnstown,Pa. B2	175
Kokomo,Ind. C16	177
Minnequa,Colo. C10	180
Pittsburg,Calif. C11	194
Rankin,Pa. A7	175
S.Chicago,Ill. R2	175
SparrowsPt.,Md. B2	177
Sterling(7) N15	175
Worcester,Mass. A7	181

TIE WIRE, Automatic Baler (14½ Ga.)(Per 97 lb Net Box)
Coil No. 3150

AlabamaCity,Ala. R2	$10.26
Atlanta A11	.....10.36
Bartonville,Ill. K4	.....10.36
Buffalo W12	.....9.82
Chicago W13	.....10.26
Crawfordsville,Ind. M8	10.36
Donora,Pa. A7	.....10.26
Duluth A7	.....10.26
Fairfield,Ala. T2	.....10.26
Houston S5	.....10.51
Jacksonville,Fla. M8	..10.82
Johnstown,Pa. B2	.....10.26
Joliet,Ill. A7	.....10.26
KansasCity,Mo. S5	.....10.51
Kokomo,Ind. C16	.....10.36
LosAngeles B3	.....11.05
Minnequa,Colo. C10	...10.51
Pittsburg,Calif. C11	...11.04
S.Chicago,Ill. R2	.....10.26
S.SanFrancisco C10	...11.04
SparrowsPt.,Md. B2	...10.36
Sterling,Ill.(37) N15	...10.36

Coil No. 6500 Stand.

AlabamaCity,Ala. R2	.$10.60
Atlanta A11	.....10.70
Bartonville,Ill. K4	.....10.70
Buffalo W12	.....10.60
Chicago W13	.....10.60
Crawfordsville,Ind. M8	10.70
Donora,Pa. A7	.....10.60
Duluth A7	.....10.60
Fairfield,Ala. T2	.....10.60
Houston S5	.....10.85
Jacksonville,Fla. M8	..11.16
Johnstown,Pa. B2	....10.60
Joliet,Ill. A7	.....10.60
KansasCity,Mo. S5	....10.85
Kokomo,Ind. C16	....10.70
LosAngeles B3	.....11.40
Minnequa,Colo. C10	...10.85
Pittsburg,Calif. C11	...11.40
S.Chicago,Ill. R2	.....10.60
S.SanFrancisco C10	...11.40
SparrowsPt.,Md. B2	...10.70
Sterling,Ill.(37) N15	...10.70

Coil No. 6500 Interim

AlabamaCity,Ala. R2	..$10.65
Atlanta A11	.....10.75
Bartonville,Ill. K4	.....10.75
Buffalo W12	.....10.20
Chicago W13	.....10.65
Crawfordsville,Ind. M8	10.75
Donora,Pa. A7	.....10.65
Duluth A7	.....10.65
Fairfield,Ala. T2	....10.65
Houston S5	.....10.90
Jacksonville,Fla. M8	..11.21
Johnstown,Pa. B2	....10.65
Joliet,Ill. A7	.....10.65
KansasCity,Mo. S5	....10.90
Kokomo,Ind. C16	....10.75
LosAngeles B3	.....11.45
Minnequa,Colo. C10	...10.90
Pittsburg,Calif. C11	...11.45
S.Chicago,Ill. R2	....10.65
S.SanFrancisco C10	...11.45
SparrowsPt.,Md. B2	...10.75
Sterling,Ill.(37) N15	...10.75

BALE TIES, Single Loop **Col.**

AlabamaCity,Ala. R2	..212
Atlanta A11	214
Bartonville,Ill. K4	214
Crawfordsville,Ind. M8	..214
Donora,Pa. A7	212
Duluth A7	212
Fairfield,Ala. T2	212
Houston S5	217
Jacksonville,Fla. M8	219
Joliet,Ill. A7	212
KansasCity,Mo. S5	217
Kokomo,Ind. C16	214
Minnequa,Colo. C10	217
Pittsburg,Calif. C11	236
S.SanFrancisco C10	236
Sterling,Ill.(7) N15	214
SparrowsPt.,Md. B2	214
Williamsport,Pa. S19	175

FENCE POSTS

Birmingham C15	171
ChicagoHts.,Ill. C2, I-2	.172
Duluth A7	172
Franklin,Pa. F5	172
Huntington,W.Va. C15	..171
Johnstown,Pa. B2	172
Marion,O. P11	172
Minnequa,Colo. C10	177
Sterling,Ill.(1) N15	172
Tonawanda,N.Y. B12	..174

WIRE, Barbed **Col.**

AlabamaCity,Ala. R2	..193**
Aliquippa,Pa. J5	.....190§
Atlanta A11	.....198*
Bartonville,Ill. K4	198
Crawfordsville,Ind. M8	..198
Donora,Pa. A7	.....193†
Duluth A7	.....193†
Fairfield,Ala. T2	.....193†
Houston,Tex. S5	.....198**
Jacksonville,Fla. M8	203
Johnstown,Pa. B2	.....196§
Joliet,Ill. A7	.....193†
KansasCity,Mo. S5	..198**
Kokomo,Ind. C16	.....195†
Minnequa,Colo. C10	...198**
Monessen,Pa. P7	.....196*
Pittsburg,Calif. C11	..213†
Rankin,Pa. A7	.....193†
S.Chicago,Ill. R2	.....193**
S.SanFrancisco C10	..213**
SparrowsPoint,Md. B2	..198§
Sterling,Ill.(7) N15	....198§

WOVEN FENCE, 9-15 Ga. **Col.**

Ala.City,Ala. R2	.....187**
Aliq'ppa,Pa.9-14½ga.J5	190§
Atlanta A11	.....192*
Bartonville,Ill. K4	192
Crawfordsville,Ind. M8	..192
Donora,Pa. A7	.....187†
Duluth A7	.....187†
Fairfield,Ala. T2	.....187†
Houston,Tex. S5	.....192**
Jacksonville,Fla. M8	...197
Johnstown,Pa.(43) B2	..190§
Joliet,Ill. A7	.....187†
KansasCity,Mo. S5	....192**
Kokomo,Ind. C16	.....189†
Minnequa,Colo. C10	..192**
Pittsburg,Calif. C11	...210†
Rankin,Pa. A7	.....187†
S.Chicago,Ill. R2	.....187**
Sterling,Ill.(7) N15	....192§

WIRE (16 gage)	An'ld Stone	Galv. Stone
Ala.City,Ala.R2	17.15	18.70**
Aliq'ppa,Pa. J5	17.15	18.95
Bartonville K4	.17.25	19.05
Cleveland A7	...17.15	....
Crawfordsville M8	17.25	19.05
Fostoria,O. S1	..17.65	19.20†
Houston S5	....17.40	18.95**
Jacksonville M8	17.50	19.30
Johnstown B2	..17.15	18.95§
Kan.City,Mo. S5	17.40	....
Kokomo C16	...17.25	18.80†
Minnequa C10	..17.40	18.95**
P'im'r,Mass.W12	17.45	19.00†
Pitts.,Calif. C11	17.50	19.05†
SparrowsPt. B2	17.25	19.05§
Sterling(37) N15	17.25	19.05§
Waukegan A7	..17.15	18.70†
Worcester A7	..17.45	....

WIRE, Merchant Quality

(6 to 8 gage)	An'ld Stone	Galv. Stone
Ala.City,Ala. R2	18.65	19.40**
Aliquippa J5	....8.65	9.325§
Atlanta (48) A11	8.75	9.425*
Bartonville(48) K4	8.75	9.425
Buffalo W12	....8.65	9.20†
Cleveland A7	....8.65	....
Crawfordsville M8	8.75	9.425
Donora,Pa. A7	...8.65	9.20†
Duluth A7	.....8.65	9.20†
Fairfield T2	.....8.65	9.20†
Houston(48) S5	..8.90	9.45**
Jacks'ville,Fla. M8	9.00	9.675
Johnstown B2(48)	8.65	9.325§
Joliet,Ill. A7	....8.65	9.20†
Kans.City(48) S5	8.90	9.45**
Kokomo C16	....8.75	9.30†
LosAngeles B3	..9.60	10.275§
Minnequa C10	...8.90	9.45**
Monessen P7(48)	..8.65	9.25*
Palmer,Mass. W12	8.95	9.50†
Pitts.,Calif. C11	..9.60	10.15†
Rankin,Pa. A7	..8.65	9.20†
S.Chicago R2	...8.65	9.20**
S.SanFran. C10	9.60	10.15**
Spar'wsPt.B2(48)	8.75	9.425§
Sterling(48) N15	..8.90	9.575§
Sterling(1)(48)	..8.80	9.475§
Struth'rs,O.(48)Y1	8.65	9.30‡
Worcester,Mass.A7	8.95	9.50†

Based on zinc price of: *13.50c. †5c. §10c. ‡Less than 10c. ††10.50c. **Subject to zinc equalization extras.

FASTENERS

(Base discounts, full container quantity, per cent off list, f.o.b. mill)

BOLTS

Carriage, Machine Bolts
Full Size Body (cut thread)
½ in. and smaller:
6 in. and shorter.... 52.5
Longer than 6 in. .. 43.5
⅝ in. thru 1 in.:
6 in. and shorter.... 43.5
Longer than 6 in. .. 41.5
1⅛ in. and larger:
All lengths 41.5
Undersized Body (rolled thread)
½ in. and smaller:
6 in. and shorter... 52.5

Carriage, Machine, Lag Bolts
Hot Galvanized:
½ in. and smaller:
6 in. and shorter... 32.0
Longer than 6 in. .. 19.0
⅝ in. and larger:
All lengths 16.0
Lag Bolts (all diam.)
6 in. and shorter... 52.5
Longer than 6 in. .. 44.5
Plow and Tap Bolts
½ in. and smaller by 6 in. and shorter 52.0
Larger than ½ in. or longer than 6 in. .. 44.5
Blank Bolts 44.5
Step, Elevator, Tire Bolts 52.0
Stove Bolts, Slotted:
⅛ to ¾-in. incl.:
3 in. and shorter.. 54.00
⅞ to 1½ in., inclusive 54.00

NUTS

Reg. & Heavy Square Nuts:
All sizes 58.0
Square Nuts, Reg. & Heavy, Hot Galvanized:
All sizes 44.0
Hex Nuts, Reg. & Heavy, Hot Pressed:
¾ in. and smaller.. 61.5
⅞ in. to 1 in., incl. 57.5
1⅛ in. to 1½ in., incl. 62.5
1⅝ in. and larger.. 56.0
Hex Nuts, Reg. & Heavy, Cold Punched:
¾ in. and smaller.. 61.5
⅞ in. to 1½ in., incl. 57.5
1⅝ in. and larger.. 56.0
Hex Nuts, All Types, Hot Galvanized:
¾ in. and smaller.. 48.0
⅞ in. to 1 in., incl.. 44.0
1¼ in. to 1½ in., incl. 49.0

Hex Nuts, Semifinished, Heavy (Incl. Slotted):
¾ in. and smaller.. 61.5
⅞ in. to 1½ in., incl. 57.5
1⅝ in. and larger.. 56.0
Hex Nuts, Finished (Incl. Slotted and Castillated):
1 in. and smaller.. 64.0
1⅛ in. to 1½ in., incl. 60.5
1⅝ in. and larger .. 56.0
Semifinished Hex Nuts, Reg. (Incl. Slotted):
⅝ in. and smaller.. 61.5
¾ in. to 1 in., Incl. 64.0
1⅛ in. to 1½ in., incl. 60.5
1⅝ in. and larger .. 56.0

CAP AND SETSCREWS
(Base discounts, packages, per cent off list, f.o.b. mill)
Hex Head Capscrews, Coarse or Fine Thread, Bright:
6 in. and shorter:
½ in. and smaller.. 44.0
¾, ⅞ and 1 in. diam. 27.0
Longer than 6 in.:
⅝ in. and smaller.. 14.0
¾, ⅞ and 1 in. diam. 0.5
High Carbon, Heat Treated:
6 in. and shorter:
⅝ in. and smaller.. 31.0
¾, ⅞ and 1 in. diam. 9.0
Longer than 6 in.:
⅝ in. and smaller.. +6
¾, ⅞ and 1 in. diam. ..... +24
Flat Head Capscrews:
¾ in. and smaller.. +65.0
Setscrews, Square Head, Cup Point, Coarse Thread:
Through 1 in. diam:
6 in. and shorter... 11
Longer than 6 in...+10

RIVETS

F.o.b. Cleveland and/or freight equalized with Pittsburgh, f.o.b. Chicago and/or freight equalized with Birmingham except where equalization is too great.
Structural ½ in., larger 12.25
1/16 in. under list less 19%.

BOILER TUBES

Net base c.l. prices, dollars per 100 ft, mill; minimum wall thickness, cut lengths 10 to 24 ft, inclusive.

O.D. In.	B.W. Gage	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.
1	13	....	25.98	23.54
1¼	13	....	30.78	23.36
1½	13	29.03	34.01	25.83
1¾	13	34.29	40.18	30.51
2	13	38.44	45.05	34.20
2¼	13	43.29	50.75	38.52
2½	12	46.99	55.06	41.81
2¾	12	51.76	60.65	46.05
2¾	12	56.04	65.67	49.88
3	12	59.76	70.03	53.19

RAILWAY MATERIALS

	Standard No. 1	Standard No. 2	Tee Rails All	Tee Rails 60 lb Under
RAILS				
Bessemer,Pa. U5	5.525	5.425	....	6.50
Ensley,Ala. T2	5.525	5.425	....	6.50
Fairfield,Ala. T2	....	....	....	6.50
Huntington,W.Va. C15	....	....	....	6.50
Gary,Ind U5	5.525	5.425	....	...
IndianaHarbor,Ind. I-2	5.525	5.425	5.475	....
Johnstown,Pa. B2	....	....	....	(16)6.50
Lackawanna,N.Y. B2	5.525	5.425	....	6.50
Minnequa,Colo. C10	5.525	5.425	....	7.00
Steelton,Pa. B2	5.525	5.425	....	....
Williamsport,Pa. S19	....	....	....	6.50

TIE PLATES

Fairfield,Ala. T2	.....6.60
Gary,Ind. U5	.....6.60
Ind.Harbor,Ind. I-2	....6.60
Lackawanna,N.Y. B2	...6.60
Minnequa,Colo. C10	....6.60
Seattle B3	.....6.75
Steelton,Pa. B2	.....6.60
Torrance,Calif. C11	....6.75

JOINT BARS

Bessemer,Pa. U5	....6.975
Fairfield,Ala. T2	....6.975
Ind.Harbor,Ind. I-2	...6.975
Joliet,Ill. U5	.....6.975
Lackawanna,N.Y. B2	..6.975
Minnequa,Colo. C10	...6.975
Steelton,Pa. B2	.....6.975

AXLES

Ind.Harbor,Ind. S13	...8.775
Johnstown,Pa. B2	....8.775

TRACK BOLTS, Untreated

Cleveland R2	.....14.75
KansasCity,Mo. S5	....14.75
Lebanon,Pa. B2	.....14.75
Minnequa,Colo. C10	...14.75
Pittsburgh P14	.....14.75
Seattle B3	.....15.25

SCREW SPIKES

Lebanon,Pa. B2	.....14.50

STANDARD TRACK SPIKES

Fairfield,Ala. T2	.....9.75
Ind.Harbor,Ind. I-2, Y1	9.75
KansasCity,Mo. S5	....9.75
Lebanon,Pa. B2	.....9.75
Minnequa,Colo. C10	...9.75
Pittsburgh J5	.....9.75
Seattle B3	.....10.25
S.Chicago,Ill. R2	.....9.75
Struthers,O. Y1	.....9.75
Youngstown R2	.....9.75

Footnotes

(1) Chicago base.
(2) Angles, flats, bands.
(3) Merchant.
(4) Reinforcing.
(5) 1¼ to under 1 7/16 in.; 1 7/16 to under 1 15/16 in., 6.70c; 1 15/16 to 8 in., inclusive, 7.05c.
(6) Chicago or Birm. base.
(7) Chicago base 2 cols. lower.
(8) 13 Ga. and heavier.
(9) Merchant quality; add 0.35c for special quality.
(10) Pittsburgh base.
(11) Cleveland & Pitts. base.
(12) Worcester, Mass., base.
(13) Add 0.25c for 17 Ga. & heavier.
(14) Gage 0.143 to 0.249 in.; for gage 0.142 and lighter, 5.80c.
(15) ¾" and thinner.
(16) 40 lb and under.
(17) Flats only; 0.25 in. & heavier.
(18) To dealers.
(19) Chicago & Pitts. base.
(20) Plus 1c per 100 lb.
(21) New Haven, Conn. base.
(22) Deld. San Francisco Bay area.
(23) Special quality.
(24) Deduct 0.15c, finer than 15 Ga.
(25) Bar mill bands.
(26) Delivered in mill zone, 6.045c.
(27) Bar mill sizes.
(28) Bonderized.
(29) Youngstown base.
(30) Sheared; for universal mill add 0.50c.
(31) Widths over ⅝ in.; 7.60c, for widths ⅝ in. and under by 0.125 in. and thinner.
(32) Buffalo base.
(33) To jobbers, deduct 20c.
(34) 9.60c for cut lengths.
(35) 72" and narrower.
(36) 54" and narrower.
(37) Chicago base, 10 points lower.
(38) 14 Ga. & lighter; 48" & narrower.
(39) 48" and narrower.
(40) Lighter than 0.035"; 0.035" and heavier, 0.25c higher.
(41) 9.10c for cut lengths.
(42) Mill lengths, f.o.b. mill; deld. in mill zone or within switching limits, 5.685c.
(43) 9-14½ Ga.
(44) To fabricators.
(45) 0.022 in. and lighter, over 0.022"; 8.20c.
(46) Special quality.
(48) 6-7 Ga.
(49) 3½ in. and smaller rounds; 8.65c, over 3½ in. and other shapes.

SEAMLESS STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—inches	2		2½		3		3½		4		5		6	
List Per Ft	37c		58.5c		76.5c		92c		$1.09		$1.48		$1.92	
Pounds Per Ft	3.68		5.82		7.62		9.20		10.89		14.81		19.18	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	+9.25	+24.25	+2.75	+19.5	+0.25	+17	1.25	+15.5	1.25	+15.5	1	+15.75	3.5	+13.25
Ambridge, Pa. N2	+9.25	....	+2.75	....	+0.25	....	1.25	....	1.25	....	1	....	3.5	....
Lorain, O. N3	+9.25	+24.25	+2.75	+19.5	+0.25	+17	1.25	+15.5	1.25	+15.5	1	+15.75	3.5	+13.25
Youngstown Y1	+9.25	+24.25	+2.75	+19.5	+0.25	+17	1.25	+15.5	1.25	+15.5	1	+15.75	3.5	+13.25

ELECTRICWELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Youngstown R2	+9.25	+24.25	+2.75	+19.5	+0.25	+17	1.25	+15.5	1.25	+15.5	1	+15.75	3.5	+13.25

BUTTWELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	⅛		¼		⅜		½		¾		1		1¼	
List Per Ft	5.5c		6c		6c		8.5c		11.5c		17c		23c	
Pounds Per Ft	0.24		0.42		0.57		0.85		1.13		1.68		2.28	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	....	....	....	....	....	....	5.25	+10	8.25	+6	11.75	+1.5	14.25	+0.75
Alton, Ill. L1	....	....	....	....	....	....	3.25	+12	6.25	+8	9.75	+3.5	12.25	+2.75
Benwood, W. Va. W10	4.5	+22	+7.5	+31	+18	+39.5	5.25	+10	8.25	+6	11.75	+1.5	14.25	+0.75
Butler, Pa. F6	5.5	+21	+6.5	+30	+17	+38.5	....	....	....	....	....	....	....	....
Etna, Pa. N2	....	....	....	....	....	....	5.25	+10	8.25	+6	11.75	+1.5	14.25	+0.75
Fairless, Pa. N3	....	....	....	....	....	....	3.25	+12	6.25	+8	9.75	+3.5	12.25	+2.75
Fontana, Calif. K1	....	....	....	....	....	....	+8.25	+23.5	+5.25	+19.5	+1.75	+15	0.75	+14.25
Indiana Harbor, Ind. Y1	....	....	....	....	....	....	4.25	+11	7.25	+7	10.75	+2.5	13.25	+3.25
Lorain, O. N3	....	....	....	....	....	....	5.25	+10	8.25	+6	11.75	+1.5	14.25	+0.75
Sharon, Pa. S4	5.5	+21	+6.5	+30	+17	+38.5	....	....	....	....	....	....	....	....
Sharon, Pa. M6	....	....	....	....	....	....	5.25	+10	8.25	+6	11.75	+1.5	14.25	+0.75
Sparrows Pt., Md. B2	3.5	+23	8.5	+32	+19	+40.5	3.25	+12	6.25	+8	9.75	+3.5	12.25	+2.75
Wheatland, Pa. W9	5.5	+21	+6	+30	+17	+38.5	5.25	+10	8.25	+6	11.75	+1.5	14.25	+0.75
Youngstown R2, Y1	....	....	....	....	....	....	5.25	+10	8.25	+6	11.75	+1.5	14.25	+0.75

Size—Inches	1½		2		2½		3		3½		4	
List Per Ft	27.5c		37c		58.5c		76.5c		92c		$1.09	
Pounds Per Ft	2.73		3.68		5.82		7.62		9.20		10.89	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	14.75	0.25	15.25	0.75	16.75	0.5	16.75	0.5	....	....	....	....
Alton, Ill. L1	12.75	+1.75	13.25	+1.25	14.75	+1.5	14.75	+1.5	....	....	....	....
Benwood, W. Va. W10	14.75	0.25	15.25	0.75	16.75	0.5	16.75	0.5	6.25	+10.5	6.25	+10.5
Etna, Pa. N2	14.75	0.25	15.25	0.75	16.75	0.5	16.75	0.5	6.25	+10.5	6.25	+10.5
Fairless, Pa. N3	12.75	+1.75	13.25	+1.25	14.75	+1.5	14.75	+1.5	4.25	+12.5	4.25	+12.5
Fontana, Calif. K1	1.25	+13.25	1.75	+12.75	3.25	+13	3.25	+13	+7.25	+24	+7.25	+24
Indiana Harbor, Ind. Y1	13.75	+0.75	14.25	+0.25	15.75	+0.5	15.25	+0.5	5.25	+11.5	5.25	+11.5
Lorain, O. N3	14.75	0.25	15.25	0.75	16.75	0.5	16.75	0.5	....	....	....	....
Sharon, Pa. M6	14.75	0.25	15.25	0.75	16.75	0.5	16.75	0.5	....	....	....	....
Sparrows Pt., Md. B2	12.75	+1.75	13.25	+1.25	14.75	+1.5	14.75	+1.5	4.25	+12.5	4.25	+12.5
Wheatland, Pa. W9	14.75	0.25	15.25	0.75	16.75	0.5	16.75	0.5	6.25	+10.5	6.25	+10.5
Youngstown R2, Y1	14.75	0.25	15.25	0.75	16.75	0.5	16.75	0.5	6.25	+10.5	6.25	+10.5

*Galvanized pipe discounts based on current price of zinc (10.00c, East St. Louis).

Stainless Steel

Representative prices, cents per pound; subject to current lists of extras

AISI Type	—Rerolling— Ingot	Slabs	Forging Billets	H.R. Strip	Wire Rods; C.F. Wire	Bars; Structural Shapes	Plates	Sheets	C.R. Strip; Flat Wire
201	22.00	27.00	....	36.00	....	42.00	44.25	48.50	45.00
202	23.75	30.25	36.50	39.00	40.75	43.00	45.00	49.25	49.25
301	23.25	28.00	37.25	37.25	42.00	44.25	46.25	51.25	47.50
302	25.25	31.50	38.00	40.50	42.75	45.00	47.25	52.00	52.00
302B	25.50	32.75	40.75	45.75	45.00	47.25	49.50	57.00	57.00
303	....	32.00	41.00	....	45.50	48.00	50.00	56.75	56.75
304	27.00	33.25	40.50	44.25	45.25	47.75	50.75	55.50	55.50
304L	....	....	48.25	51.50	53.00	55.50	58.50	63.25	63.25
305	28.50	36.75	42.50	47.50	45.25	47.75	51.25	58.75	58.75
308	30.75	38.25	47.25	50.25	52.75	55.75	60.25	63.00	63.00
309	39.75	49.50	57.75	64.50	63.75	67.00	71.00	80.50	80.50
310	49.75	61.50	78.00	84.25	86.50	91.00	92.75	96.75	96.75
314	....	....	....	....	86.50	....	92.75	....	104.50
316	39.75	49.50	62.25	69.25	69.25	73.00	76.75	81.50	81.50
316L	....	....	70.00	76.50	77.00	80.75	84.50	89.25	89.25
317	48.00	60.00	76.75	88.25	86.25	90.75	93.50	101.00	101.00
321	32.25	40.00	47.00	53.50	52.50	55.50	59.75	65.50	65.50
330	....	....	118.75	....	132.00	138.50	105.50	108.00	149.25
18-8 CbTa	37.00	46.50	55.75	63.50	61.50	64.75	69.75	79.25	79.25
403	....	....	32.00	....	35.75	37.75	40.25	48.25	48.25
405	19.50	25.50	29.75	36.00	33.50	35.25	37.50	46.75	46.75
410	16.75	21.50	28.25	31.00	32.00	33.75	35.00	40.25	40.25
416	....	....	28.75	....	32.50	34.25	36.25	48.25	48.25
420	....	33.50	34.25	41.75	39.25	41.25	45.25	62.00	62.00
430	17.00	21.75	28.75	32.00	32.50	34.25	36.00	40.75	40.75
430F	....	....	29.50	....	33.00	34.75	36.75	51.75	51.75
431	....	28.75	37.75	....	42.00	44.25	46.00	56.00	56.00
446	....	....	39.25	59.00	44.25	46.50	47.75	70.00	70.00

Stainless Steel Producers Are: Allegheny Ludlum Steel Corp.; Alloy Metal Wire Div., H. K. Porter Co. Inc.; Alloy Tube Div., Carpenter Steel Co.; American Steel & Wire Div., U. S. Steel Corp.; Armco Steel Corp.; Babcock & Wilcox Co.; Bethlehem Steel Co.; J. Bishop & Co.; G. O. Carlson Inc.; Charter Wire Products Co.; Crucible Steel Co. of America; Damascus Tube Co.; Dearborn Div., Sharon Steel Corp.; Wilbur B. Driver Co.; Driver-Harris Co.; Eastern Stainless Steel Corp.; Elwood Ivins Steel Tube Works Inc.; Firth Sterling Inc.; Ft. Wayne Metals Inc.; Globe Steel Tubes Co.; Helical Tube Co.; Indiana Steel & Wire Co.; Ingersoll Steel Div., Borg-Warner Corp.; Jessop Steel Co.; Johnson Steel & Wire Co. Inc.; Jones & Laughlin Steel Corp.; Joslyn Mfg. & Supply Co.; Kennmore Metals Corp.; Maryland Fine & Specialty Wire Co.; McInnes Steel Co.; McLouth Steel Corp.; Metal Forming Corp.; National-Standard Co.; National Tube Div., U. S. Steel Corp.; Newman-Crosby Steel Co.; Pacific Tube Co.; Page Steel & Wire Div., American Chain & Cable Co. Inc.; Pittsburgh Rolling Mills Inc.; Republic Steel Corp.; Rodney Metals Inc.; Rome Mfg. Co.; Sawhill Tubular Products Inc.; Sharon Steel Corp.; Simonds Saw & Steel Co.; Specialty Wire Co. Inc.; Spencer Wire Corp.; Stainless Welded Products Inc.; Standard Tube Co.; Stainless Steel Div., Jones & Laughlin Steel Corp.; Superior Steel Corp.; Superior Tube Co.; Techalloy Co. Inc.; Timken Roller Bearing Co.; Trent Tube Co.; Tube Methods Inc.; Ulbrich Stainless Steels; United States Steel Corp.; Universal-Cyclops Steel Co.; Wallingford Steel Co.; Washington Steel Corp.

Clad Steel

Stainless	Plates 5% Carbon Base	10% Carbon Base	15% Carbon Base	20% Carbon Base	Sheets 20% Carbon Base
302	....	....	....	....	37.50
304	34.70	37.95	42.25	46.70	40.00
304L	36.90	40.55	45.10	49.85	....
316	40.35	44.40	49.50	54.50	58.75
316L	45.05	49.35	54.70	60.10	....
316 Cb	47.30	53.80	61.45	69.10	....
321	36.60	40.05	44.60	49.30	47.25
347	38.25	42.40	47.55	52.80	57.00
405	28.60	29.85	33.35	36.85	....
410	28.15	29.55	33.10	36.70	....
430	28.30	29.80	33.55	37.25	....
Inconel	48.90	59.55	70.15	80.85	....
Nickel	41.65	51.95	62.30	72.70	....
Nickel, Low Carbon	41.95	52.60	63.30	74.15	....
Monel	43.35	53.55	63.80	74.05	....
Copper*	....	....	....	....	46.00

	Strip, Carbon Base —Cold Rolled— 10%	Both Sides
Copper*	33.95	40.25

*Deoxidized. Production points: Stainless-clad sheets, New Castle, Ind. I-4; stainless-clad plates, Claymont, Del. C22, Coatesville, Pa. L7, New Castle, Ind. I-4, and Washington, Pa. J3; nickel, inconel, monel-clad plates. Coatesville L7; copper-clad strip, Carnegie, Pa. S18.

Tool Steel

Grade	$ per lb	Grade	$ per lb
Regular Carbon	0.290	Cr Hot Work	0.45-0.495
Extra Carbon	0.345	W-Cr Hot Work	0.43-0.475
Special Carbon	0.41-0.45	V-Cr Hot Work	0.460
Oil Hardening	0.450	Hi-Carbon-Cr	0.830

Grade by Analysis (%)

W	Cr	V	Co	Mo		$ per lb
20.25	4.25	1.6	12.25	....	....	4.170
18.25	4.25	1	4.75	....	....	2.385
18	4	2	9	....	....	2.755
18	4	2	....	....	....	1.845
18	4	1	....	....	....	1.680
9	3.5	..	....	....	....	1.275
13.5	4	3	....	....	....	1.945
13.75	3.75	2	5	....	....	2.325
6.4	4.5	1.9	....	5	....	1.185
6	4	3	....	6	....	1.430
1.5	4	1	....	8.5	....	1.040

Tool steel producers include: A4, A8, B2, B8, C4, C9, C13, C18, F2, J3, L3, M14, S8, U4, V2, and V3.

Pig Iron

F.o.b. furnace prices in dollars per gross ton, as reported to STEEL. Minimum delivered prices are approximate and do not include 3% federal transportation tax.

	Basic	No. 2 Foundry	Malle-able	Besse-mer
Birmingham District				
AlabamaCity,Ala. R2	62.00	62.50	....	....
Birmingham R2	62.00	62.50‡	....	....
Birmingham U6	....	62.50‡	66.50	....
Woodward,Ala. W15	62.00**	62.50‡	66.50	....
Cincinnati, deld.	....	70.20	....	....
Buffalo District				
Buffalo H1, R2	66.00	66.50	67.00	67.50
N.Tonawanda,N.Y. T9	....	66.50	67.00	67.50
Tonawanda,N.Y. W12	66.00	66.50	67.00	67.50
Boston, deld.	77.29	77.79	78.29	....
Rochester,N.Y., deld.	69.02	69.52	70.02	....
Syracuse,N.Y., deld.	70.12	70.62	71.12	....
Chicago District				
Chicago I-3	66.00	66.50	66.50	67.00
S.Chicago,Ill. R2	66.00	....	66.50	....
S.Chicago,Ill. W14	66.00	....	66.50	67.00
Milwaukee, deld.	68.46	68.96	68.96	69.46
Muskegon,Mich., deld.	....	80.33	80.33	....
Cleveland District				
Cleveland R2, A7	66.00	66.50	66.50	67.00
Akron,O., deld.	69.12	69.62	69.62	70.12
Mid-Atlantic District				
Birdsboro,Pa. B10	68.00	68.50	69.00	69.50
Chester,Pa. P4	66.50	67.00	67.50	....
Swedeland,Pa. A3	68.00	68.50	69.00	69.50
New York, deld.	....	74.70	75.20	....
Newark,N.J., deld.	72.02	72.52	73.02	73.52
Philadelphia, deld.	69.88	70.38	70.88	71.38
Troy,N.Y. R2	68.00	68.50	69.00	69.50
Pittsburgh District				
NevilleIsland, Pa. P6	66.00	66.50	66.50	67.00
Pittsburgh (N&S sides), Aliquippa, deld.	....	67.95	67.95	68.48
McKeesRocks,Pa., deld.	....	67.60	67.60	68.13
Lawrenceville, Homestead, Wilmerding,Monaca,Pa., deld.	....	68.26	68.26	68.79
Verona,Trafford,Pa., deld.	68.29	68.82	68.82	69.35
Brackenridge,Pa., deld.	68.60	69.10	69.10	69.63
Midland,Pa. C18	66.00	....	....	....

	Basic	No. 2 Foundry	Malle-able	Besse-mer
Youngstown District				
Hubbard, O. Y1	....	....	66.50	....
Sharpsville,Pa. S6	66.00	....	66.50	67.00
Youngstown Y1	....	....	66.50	67.00
Mansfield,O., deld.	70.90	....	71.40	71.90
Duluth I-3	66.00	66.50	66.50	67.00
Erie,Pa. I-3	66.00	66.50	66.50	67.00
Everett, Mass. E1	66.50	67.00	67.50	....
Fontana,Calif. K1	74.00	74.50	....	....
Geneva,Utah C11	66.00	66.50	....	....
GraniteCity,Ill. G4	67.90	68.40	68.90	....
Ironton,Utah C11	66.00	66.50	....	....
Minnequa,Colo. C10	68.00	68.50	69.00	....
Rockwood,Tenn. T3	....	62.50‡	66.50	....
Toledo,O. I-3	66.00	66.50	66.50	67.00
Cincinnati, deld.	72.54	73.04	....	....

**Phos. 0.70-0.90%; Phos. 0.30-0.69%, $63.
‡Phos. 0.70-0.90%; Phos. 0.30-0.69%, $63.50.

PIG IRON DIFFERENTIALS

Silicon: Add 75 cents per ton for each 0.25% Si or percentage thereof over base grade, 1.75-2.25%, except on low phos. iron on which base is 1.75-2.00%.

Manganese: Add 50 cents per ton for each 0.25% manganese over 1% or portion thereof.

Nickel: Under 0.50% no extra; 0.50-0.74%, inclusive, add $2 per ton and each additional 0.25%, add $1 per ton.

BLAST FURNACE SILVERY PIG IRON, Gross Ton

(Base 6.00-6.50% silicon; add $1 for each 0.50% silicon or portion thereof over the base grade within a range of 6.50 to 11.50%; starting with silicon over 11.50% add $1.50 per ton for each 0.50% silicon or portion thereof up to 14%; add $1 for each 0.50% Mn over 1%)

Jackson,O. I-3, J1	77.25
Buffalo H1	78.50

ELECTRIC FURNACE SILVERY IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1.25 for each 0.50% Mn over 1%; $2 per gross ton premium for 0.045% max P)

CalvertCity,Ky. P15	$99.00
NiagaraFalls,N.Y. P15	99.00
Keokuk,Iowa Open-hearth & Fdry, $9 freight allowed K2	103.50
Keokuk,Iowa O.H. & Fdry, 12½ lb pigiets, 16% Si, max fr'gt allowed up to $9, K2	106.50

LOW PHOSPHORUS PIG IRON, Gross Ton

Lyles,Tenn. T3 (Phos. 0.035% max)	$78.50
Troy,N.Y. R2 (Phos. 0.035% max)	74.00
Philadelphia, deld.	81.76
Cleveland A7 (Intermediate) (Phos. 0.036-0.075% max)	71.00
Duluth I-3 (Intermediate) (Phos. 0.036-0.075% max)	71.00
Erie,Pa. I-3 (Intermediate) (Phos. 0.036-0.075% max)	71.00
NevilleIsland,Pa. P6 (Intermediate) (Phos. 0.036-0.075% max)	71.00

Warehouse Steel Products

Representative prices, per pound, subject to extras, f.o.b. warehouse. City delivery charges are 15 cents per 100 lb except: Moline, Norfolk, Richmond, Washington, 20 cents; Baltimore, Boston, Los Angeles, New York, Philadelphia, Portland, Spokane, San Francisco, 10 cents; Atlanta, Houston, Seattle no charge.

	SHEETS				STRIP	BARS			Standard Structural Shapes	PLATES	
	Hot-Rolled	Cold-Rolled	Gal. 10 Ga.†	Stainless Type 302	Hot-Rolled*	H.R. Rounds	C.F. Rds.‡	H.R. Alloy 4140††§		Carbon	Floor
Atlanta	8.59§	9.86§	10.13§	....	8.64	9.01	10.68	....	9.05	8.97	10.90
Baltimore	8.28	8.88	9.76	....	8.76	9.06	9.13§	15.18	9.19	8.66	10.14
Birmingham	8.18	9.45	10.15	....	8.23	8.60	10.57	....	8.64	8.56	10.70
Boston	9.31	10.40	11.41	....	9.35	9.68	....	15.24	9.59	9.65	11.13
Buffalo	8.25	9.45	11.07	....	8.50	8.80	....	15.00	8.90	8.90	10.45
Chattanooga	7.99	9.24	9.10	....	8.00	8.24	10.04	....	8.44	8.40	10.26
Chicago	8.20	9.45	10.00	....	8.23	8.60	8.80	14.65	8.64	8.56	9.38
Cincinnati	8.34	9.48	10.05	....	8.54	8.92	9.31	14.96	9.18	8.93	10.21
Cleveland	8.18	9.45	9.95	....	8.33	8.69	....	14.74	9.01	8.79	10.11
Denver	9.38	11.75	....	....	9.41	9.78	11.10	....	9.82	9.74	11.06
Detroit	8.43	9.70	10.35	....	8.58	8.90	9.15	14.91	9.18	8.91	10.13
Erie, Pa.	8.20	9.45	9.95¶	....	8.50	8.75	9.05¶	....	9.00	8.85	10.10
Houston	8.45	9.75	8.45	....	8.60	9.05	11.10	....	9.10	9.05	10.30
Jackson, Miss.	8.09	9.34	9.79	....	8.16	8.41	10.23	....	8.54	8.50	10.34
Los Angeles	9.50	10.75	11.65	....	9.55	9.70	12.75	16.00	9.60	9.55	11.70
Milwaukee	8.33	9.58	10.13	....	8.36	8.73	9.03	14.78	8.85	8.69	10.01
Moline, Ill.	8.55	9.80	10.35	....	8.58	8.95	9.15	....	8.99	8.91	....
New York	8.87	10.13	10.56	....	9.31	9.57	....	15.09	9.35	9.43	10.71
Norfolk, Va.	8.05	....	....	....	8.55	8.60	10.80	....	8.95	8.45	9.95
Philadelphia	8.00	8.90	9.97	51.94	8.67	8.65	9.76	15.01	8.50	8.77	9.77**
Pittsburgh	8.18	9.45	10.35	50.00	8.33	8.60	....	14.65	8.64	8.56	9.88
Portland, Oreg.	9.50	11.20	11.55	57.20	11.35‡‡	9.65	14.65	15.95	9.65	9.30	12.50
Richmond, Va.	8.45	....	10.40	....	9.15	9.15	....	....	9.40	8.85	10.35
St. Louis	8.54	9.79	10.36	....	8.59	8.97	9.41	15.01	9.10	8.93	10.25
St. Paul	8.79	10.04	10.61	....	8.84	9.22	9.66	....	9.38	9.30	10.49
San Francisco	9.35	10.75	11.00	54.85	9.45	9.70	13.00	16.10	9.50	9.60	12.00
Seattle	9.95	11.15	12.00	57.20	10.00	10.10	14.05	16.35	9.80	9.70	12.10
Spokane, Wash.	9.95	11.15	12.00	....	10.00	10.10	14.05	17.10	9.80	9.70	12.10
Washington	8.48	9.58	....	....	9.06	9.15	9.73	....	9.35	8.86	10.36

*Prices do not include gage extras; †prices include gage and coating extras, except in Birmingham (coating extra excluded); ‡includes 35-cent bar quality extras; §42 in. and under; **⅜-in. and heavier; ††as annealed; ‡‡over 4 in.; §§over 3 in.

Base quantities, 2000 to 4999 lb except as noted; cold-rolled strip and cold-finished bars, 2000 lb and over except in Seattle, 2000 to 9999 lb, and in Los Angeles, 6000 lb and over; stainless sheets, 8000 lb except in Chicago, New York, Boston, Seattle, Portland, Oreg. 10,000 lb and in San Francisco, 2000 to 4999 lb; hot-rolled products on West Coast, 2000 to 9999 lb, except in Portland, Oreg., 1000 to 9999 lb; [3]—400 to 9999 lb; [6]—1000 to 1999 lb; [8]—2000 to 3999 lb; [10]—2000 lb and over.

This 240,000-pound steam drum, built by Combustion Engineering for a large generating plant, is here being hoisted 120 feet into position by strong wire rope. It's a striking example of how . . .

safety rides on quality wire rope

You may never hoist loads as large as this 120-ton drum. But *safe, top quality wire rope is just as important to your own operations.* For, although the price of a "bargain" rope would be less, failure of such a rope could cost you thousands of dollars in wrecked equipment. Don't be a victim of false economy. Buy a wire rope that's a quality rope—buy Wickwire Rope.

5339

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LOOK FOR THE YELLOW TRIANGLE

PRODUCT OF WICKWIRE SPENCER STEEL DIVISION
THE COLORADO FUEL AND IRON CORPORATION

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Refractories

Fire Clay Brick (per 1000)

High-Heat Duty: Ashland, Grahn, Hayward, Hitchins, Haldeman, Olive Hill, Ky., Athens, Troup, Tex., Beech Creek, Clearfield, Curwensville, Lock Haven, Lumber, Orviston, West Decatur, Pa., Bessemer, Ala., Farber, Mexico, St. Louis, Vandalia, Mo., Ironton, Oak Hill, Parral, Portsmouth, O., Ottawa, Ill., Stevens Pottery, Ga., $135; Salina, Pa., $140; Niles, O., $138; Cutler, Utah, $165.

Super-Duty: Ironton, O., Vandalia, Mo., Olive Hill, Ky., Clearfield, Salina, Pa., New Savage, Md., St. Louis, $175; Stevens Pottery, Ga., $185; Cutler, Utah, $233.

Silica Brick (per 1000)

Standard: Alexandria, Claysburg, Mt. Union, Sproul, Pa., Ensley, Ala., Pt. Matilda, Pa., Portsmouth, O., Hawstone, Pa., $150; Warren, Niles, Windham, O., Hays, Latrobe, Morrisville, Pa., $155; E. Chicago, Ind., Joliet, Rockdale, Ill., $160; Lehigh, Utah, $175; Los Angeles, $180.

Super-Duty: Sproul, Hawstone, Pa., Niles, Warren, Windham, O., Leslie, Md., Athens, Tex., $157; Morrisville, Hays, Latrobe, Pa., $160; E. Chicago, Ind., $167; Curtner, Calif., $182.

Semisilica Brick (per 1000)

Clearfield, Pa., $140; Philadelphia, $137; Woodbridge, N. J., $135.

Ladle Brick (per 1000)

Dry Pressed: Alsey, Ill., Chester, New Cumberland, W. Va., Freeport, Johnstown, Merrill Station, Vanport, Pa., Mexico, Vandalia, Mo., Wellsville, Irondale, New Salisbury, O., $96.75; Clearfield, Pa., Portsmouth, O., $102.

High-Alumina Brick (per 1000)

50 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $235; Danville, Ill., $238; Philadelphia, Clearfield, Pa., $230; Orviston, Pa., $245.

60 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $295; Danville, Ill., $298; Philadelphia, Clearfield, Orviston, Pa., $305.

70 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $335; Danville, Ill., $338; Philadelphia, Clearfield, Orviston, Pa., $345.

Sleeves (per 1000)

Reesdale, Johnstown, Bridgeburg, Pa., St. Louis, $188.

Nozzles (per 1000)

Reesdale, Johnstown, Bridgeburg, Pa., St. Louis, $310.

Runners (per 1000)

Reesdale, Johnstown, Bridgeburg, Pa., $234.

Dolomite (per net ton)

Domestic, dead-burned, bulk, Billmeyer, Blue Bell, Williams, Plymouth Meeting, York, Pa., Millville, W. Va., Bettsville, Millersville, Martin, Woodville, Gibsonburg, Narlo, O., $16.75; Thornton, McCook, Ill., $17; Dolly Siding, Bonne Terre, Mo., $15.

Magnesite (per net ton)

Domestic, dead-burned, bulk ½-in. grains with fines: Chewelah, Wash., Luning, Nev., $46; ⅜-in. grains with fines: Baltimore, $73.

Fluorspar

Metallurgical grades, f.o.b. shipping point, in Ill., Ky., net tons, carloads, effective CaF_2 content 72.5%, $37-41; 70%, $36-40; 60%, $33-36.50. Imported, net tons, f.o.b. cars point of entry duty paid, metallurgical grade: European, $33-34; Mexican, all-rail, duty paid, $25.25-25.75; barge, Brownsville, Tex., $27.25-27.75.

Metal Powder

(Per pound f.o.b. shipping point in ton lots for minus 100 mesh, except as noted)

	Cents
Sponge Iron, Swedish: Deld. east of Mississippi river, ocean bags 23,000 lb and over	10.50
F.o.b. Riverton or Camden, N. J., west of Mississippi river	9.50
Sponge Iron, domestic, 98 + % Fe.: Deld. east of Mississippi river, 23,000 lb and over	10.50
F.o.b. Riverton, N.J., west of Mississippi river	9.50
Sponge Iron, Canadian: F.o.b. shipping point	9.50
Electrolytic Iron:	
Melting stock, 99.9% Fe, irregular fragments of ⅛ in. x 1.3 in.	28.00
Annealed, 99.5% Fe	36.50
Unannealed (99+ % Fe)	36.00
Unannealed (99+ % Fe) (minus 325 mesh)	59.00
Powder Flakes (minus 16, plus 100 mesh)	29.00
Carbonyl Iron: 98.1-99.9%, 3 to 20 microns, depending on grade, 93.00-290.00 in standard 200-lb containers; all minus 200 mesh.	

	Dollars
Aluminum: Atomized, 500 lb drum, fr'ght allowed Carlots	38.20
Ton lots	40.20
Antimony, 500 lb lots	32.00*
Brass, 5000-lb lots	32.40-40.40†
Bronze, 5000-lb lots	50.20-54.70†
Copper: Electrolytic	14.25*
Reduced	14.25*
Lead	7.50*
Manganese: Minus 35 mesh	64.00
Minus 100 mesh	70.00
Minus 200 mesh	75.00
Nickel, unannealed	$1.15
Nickel-Silver, 5000-lb lots	50.70-55.30†
Phosphor-Copper, 5000-lb lots	62.00
Copper (atomized) 5000-lb lots	42.50-51.00‡
Silicon	47.50
Solder	7.00*
Stainless Steel, 304	$1.08
Stainless Steel, 316	$1.44
Tin	14.50*
Zinc, 5000-lb lots	17.50-30.70‡
Tungsten: Melting grade, 99% 60 to 2000 mesh: 1000 lb and over	3.75
Less than 1000 lb	3.90
Chromium, electrolytic 99.8% Cr min metallic basis	5.00

*Plus cost of metal. †Depending on composition. ‡Depending on mesh.

Electrodes

Threaded with nipple; unboxed, f.o.b. plant

GRAPHITE

Inches Diam.	Length	Per 100 lb
2	24	$57.75
2½	30	37.25
3	40	35.25
4	40	33.25
5½	40	33.00
6	60	30.00
7	60	26.75
8, 9, 10	60	26.50
12	72	25.50
14	60	25.50
16	72	24.50
17	60	25.50
18	72	24.50
20	72	24.00
24	84	24.75

CARBON

8	60	13.30
10	60	13.00
12	60	12.95
14	60	12.85
14	72	11.95
17	60	11.85
17	72	11.40
20	84	11.40
20	90	11.00
24	72, 84	11.25
24	96	10.95
30	84	11.05
40, 35	110	10.70
40	100	10.70

Imported Steel

(Base per 100 lb, landed, duty paid, based on current ocean rates. Any increase in these rates is for buyer's account. Source of shipment: Western continental European countries)

	North Atlantic	South Atlantic	Gulf Coast	West Coast
Deformed Bars, Intermediate, ASTM-A 305	$6.58	$6.53	$6.53	$6.76
Bar Size Angles	6.62	6.57	6.57	6.75
Structural Angles	6.62	6.57	6.57	6.75
I-Beams	6.87	6.82	6.82	7.00
Channels	6.87	6.82	6.82	7.00
Plates (basic bessemer)	8.50	8.45	8.45	8.75
Sheets, H.R.	8.50	8.45	8.45	8.75
Sheets, C.R. (drawing quality)	9.00	8.95	8.95	9.25
Furring Channels, C.R., 1000 ft, ⅞ x 0.30 lb per ft	26.79	26.67	26.67	27.36
Barbed Wire (†)	6.95	6.95	6.95	7.40
Merchant Bars	6.87	6.82	6.82	7.22
Hot-Rolled Bands	7.20	7.15	7.15	7.55
Wire Rods, Thomas Commercial No. 5	6.73	6.73	6.73	7.13
Wire Rods, O.H. Cold Heading Quality No. 5	7.07	7.07	7.07	7.47
Bright Common Wire Nails (§)	8.38	8.38	8.38	8.58

†Per 82-lb. net, reel. §Per 100-lb kegs, 20d nails and heavier.

Ores

Lake Superior Iron Ore

(Prices effective for the 1957 shipping season, gross ton, 51.50% iron natural, rail of vessel, lower lake ports.)

Mesabi bessemer	$11.60
Mesabi nonbessemer	11.45
Old range bessemer	11.85
Old range nonbessemer	11.70
Open-hearth lump	12.70
High phos.	11.45

The foregoing prices are based on upper lake rail freight rates, lake vessel freight rates, handling and unloading charges, and taxes thereon, which were in effect Jan. 30, 1957, and increases or decreases after that date are absorbed by the seller.

Eastern Local Iron Ore

Cents per unit, deld. E. Pa.

New Jersey, foundry and basic 62-64% concentrates 25.00-27.00

Foreign Iron Ore

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 65%	27.00-27.50
N. African hematite (spot)	nom.
Brazilian iron ore, 68-69%	32.00-33.00

Tungsten Ore

Net ton unit, before duty

Foreign wolframite, good commercial quality	20.00-23.00
Domestic, concentrates mine	55.00

Manganese Ore

Mn 46-48%, Indian (export tax included), $1.60-1.70 per long ton unit, c.i.f. U. S. ports, duty for buyer's account: other than Indian, $1.45-1.50; contracts by negotiation.

Chrome Ore

Gross ton f.o.b. cars New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., Tacoma, Wash.

Indian and Rhodesian

48% 3:1	$55.00-58.00
48% 2.8:1	52.00-55.00
48% no ratio	46.00-48.00

South African Transvaal

48% no ratio	$40.00-41.00
44% no ratio	30.00-31.00

Turkish

48% 3:1	$59.00-62.00

Domestic

Rail nearest seller

18% 3:1	$39.00

Molybdenum

Sulphide concentrate, per lb of Mo content, mines, unpacked $1.18

Antimony Ore

Per short ton unit of Sb content, c.i.f. seaboard

55-60%	$2.90-3.30
60-65%	3.30-3.60

Vanadium Ore

Cents per lb V_2O_5

Domestic	31.00

Metallurgical Coke

Price per net ton

Beehive Ovens

Connellsville, furnace	$14.75-15.75
Connellsville, foundry	18.00-18.50

Oven Foundry Coke

Birmingham, ovens	$28.85
Cincinnati, deld.	31.84
Buffalo, ovens	30.50
Camden, N. J., ovens	29.50
Detroit, ovens	30.50
Pontiac, deld.	32.25
Saginaw, deld.	33.83
Erie, Pa., ovens	30.50
Everett, Mass., ovens New England, deld.	31.55*
Indianapolis, ovens	29.75
Ironton, O., ovens	29.00
Cincinnati, deld.	31.84
Kearny, N. J., ovens	29.75
Milwaukee, ovens	30.50
Painesville, O., ovens	30.50
Cleveland, deld.	32.69
Philadelphia, ovens	29.50
St. Louis, ovens	31.50
Neville Island (Pittsburgh), Pa., ovens	29.25
St. Paul, ovens	29.75
Chicago, deld.	33.24
Swedeland, Pa., ovens	29.50
Terre Haute, Ind., ovens	29.75

*Or within $4.80 freight zone from works.

Coal Chemicals

Spot, cents per gallon, ovens

Pure benzene	36.00
Toluene, one deg.	32.00-34.00
Industrial xylene	32.00-35.00

Per ton, bulk, ovens

Ammonium sulfate	$32.00

Cents per pound, producing point

Phenol: Grade 1, 15.00; Grade 2-3, 14.50; Grade 4, 16.50; Grade 5, 15.25.

Ferroalloys

MANGANESE ALLOYS

Spiegeleisen: Carlot, per gross ton, Palmerton, Pa. 21-23% Mn, $105; 19-21% Mn, 1-3% Si, $102.50; 16-19% Mn, $100.50.

Standard Ferromanganese: (Mn 74-76%, C 7% approx). Base price per net ton; $255, Johnstown, Duquesne, Sheridan, Pa.; Alloy, W. Va.; Ashtabula, Marietta, O.; Sheffield, Ala.; Portland, Oreg. Add or subtract $2 for each 1% or fraction thereof of contained manganese over 76% or under 74% respectively.

(Mn 79-81%). Lump $263 per net ton, f.o.b. Anaconda or Great Falls, Mont. Add $2.60 for each 1% above 81%; subtract $2.60 for each 1% below 79%, fractions in proportion to nearest 0.1%.

High-Grade Low-Carbon Ferromanganese: (Mn 85-90%). Carload, lump, bulk, max 0.07% C, 35.1c per lb of contained Mn, carload packed 36.4c, ton lots 37.9c, less ton 39.1c. Delivered. Deduct 1.5c for max 0.15% C grade from above prices, 3c for max 0.03% C, 3.5c for max 0.50% C, and 6.5c for max 75% C—max 7% Si. **Special Grade:** (Mn 90% min, C 0.07% max, P 0.06% max). Add 2.05c to the above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85%, C 1.25-1.5%, Si 1.5% max). Carload, lump, bulk, 25.5c per lb of contained Mn, packed, carload 26.8c, ton lot 28.4c, less ton 29.6c. Delivered. Spot, add 0.25c.

Manganese Metal: 2" x D (Mn 95.5% min, Fe 2% max, Si 1% max, C 0.2% max). Carload, lump, bulk, 45c per lb of metal; packed, 45.75c; ton lot 47.25c; less ton lot 49.25c. Delivered. Spot, add 2c.

Electrolytic Manganese Metal: Min carload, 34c; 2000 lb to min carload, 36c; 500 lb to 1999 lb, 38c; 50 lb cans, add 0.5c per lb. Premium for hydrogen-removed metal, 0.75c per lb. Prices are f.o.b. cars, Knoxville, Tenn., freight allowed to St. Louis or any point east of Mississippi; or f.o.b. Marietta, O., freight allowed.

Silico-manganese: (Mn 65-68%). Contract, lump, bulk 1.50% C grade, 18-20% Si, 12.8c per lb of alloy. Packed, c.l. 14c, ton 14.45c, less ton 15.45c, f.o.b. Alloy, W. Va.; Ashtabula, Marietta, O.; Sheffield, Ala.; Portland, Oreg. For 2% C grade, Si 15-17%, deduct 0.2c from above prices. For 3% C grade Si 12-14.5%, deduct 0.4c from above prices. Spot, add 0.25c.

TITANIUM ALLOYS

Ferrotitanium, Low-Carbon: (Ti 20-25%, Al 3.5% max, Si 4% max, C 0.10% max). Contract, ton lot, 2" x D, $1.50 per lb of contained Ti; less ton $1.55. (Ti 38-43%, Al 8% max, Si 4% max, C 0.10% max). Ton lot $1.35, less ton $1.37, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis. Spot, add 5c.

Ferrotitanium, High-Carbon: (Ti 15-18%, C 6-8%). Contract $200 per ton, f.o.b. Niagara Falls, N. Y., freight allowed to destinations east of Mississippi river and north of Baltimore and St. Louis.

Ferrotitanium, Medium-Carbon: (Ti 17-21%, C 2-4.5%). Contract $225 per ton, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

CHROMIUM ALLOYS

High-Carbon Ferrochrome: Contract, c.l. lump, bulk, 27.75c per lb of contained Cr; c.l. packed 29.3c, ton lot 31.05c; less ton 32.45c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome: (Cr 67-71%). Contract, carload, lump, bulk, C 0.025% max (Simplex) 34.75c per lb contained Cr, 0.02% max 41.5c, 0.03% max 41c, 0.06% max 39.5c, 0.1% max 39c, 0.15% max 38.75c, 0.2% max 38.5c, 0.5% max 38.25c, 1.0% max 37.5c, 1.5% max 37.35c, 2.0% max 37.25c. Ton lot, add 3.4c, less ton add 5.1c. Carload packed add 1.75c. Delivered. Spot, add 0.25c.

Foundry Ferrochrome, High-Carbon: (Cr 62-66%, C 5-7%, Si 7-10%). Contract, c.l., 2 in. x D, bulk 29.05c per lb of contained Cr. Packed, c.l. 30.65c, ton 32.45c, less ton 33.95c. Delivered. Spot, add 0.25c.

Foundry Ferrosilicon Chrome: (Cr 50-54%, Si 28-32%, C 1.25% max). Contract, carload, packed, 8M x D, 20.85c, per lb of alloy, ton lot 22.10c; less ton lots 23.3c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome-Silicon: (Cr 39-41%, Si 42-49%, C 0.05% max). Contract, carload, lump, 4" x down and 2" x down, bulk, 41.35c per lb of contained Cr; 1" x down, bulk, 42.35c. Delivered.

Chromium Metal, Electrolytic: Commercial grade (Cr 99.8% min, metallic basis, Fe 0.2% max). Contract, carlot, packed 2" x D plate (about ⅛" thick) $1.29 per lb, ton lot $1.31, less ton lot $1.33. Delivered. Spot, add 5c.

VANADIUM ALLOYS

Ferrovanadium: Open-hearth Grade (V 50-55%, Si 8% max, C 3% max). Contract, any quantity, $3.20 per lb of contained V. Delivered. Spot, add 10c. **Special Grade:** (V 50-55% or 70-75%, Si 2% max, C 0.5% max) $3.30. **High Speed Grade:** (V 50-55%, or 70-75%, Si 1.50% max, C 0.20% max) $3.40.

Grainal: Vanadium Grainal No. 1 $1.05 per lb; No. 6, 68c; No. 79, 50c, freight allowed.

Vanadium Oxide: Contract, less carload lot, packed, $1.38 per lb contained V_2O_5, freight allowed. Spot, add 5c.

SILICON ALLOYS

25-30% Ferrosilicon: Contract, carload, lump, bulk, 20.0c per lb of contained Si. Packed 21.40c; ton lot 22.50c, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

50% Ferrosilicon: Contract, carload, lump, bulk, 13c per lb of contained Si. Packed c.l. 15.5c, ton lot 16.95c, less ton 18.6c, f.o.b. Alloy, W. Va.; Ashtabula, Marietta, O.; Sheffield, Ala.; Portland, Oreg. Spot, add 0.45c.

Low-Aluminum 50% Ferrosilicon: (Al 0.40% max). Add 1.45c to 50% ferrosilicon prices.

65% Ferrosilicon: Contract, carload, lump, bulk, 15.25c per lb contained silicon. Packed, c.l. 17.25c, ton lot 19.05c; less ton 20.4c. Delivered. Spot, add 0.35c.

75% Ferrosilicon: Contract, carload, lump, bulk, 16.4c per lb of contained Si. Packed, c.l. 18.30c, ton lot 19.95c, less ton 21.2c. Delivered. Spot, add 0.3c.

90% Ferrosilicon: Contract, carload, lump, bulk, 19.5c per lb of contained Si. Packed, c.l. 21.15c, ton lot 22.55c, less ton 23.6c. Delivered. Spot, add 0.25c.

Silicon Metal: (98% min Si, 0.75% max Fe, 0.07% max Ca). C.l. lump, bulk, 20.00c per lb of Si. Packed, c.l. 21.65c, ton lot 22.95c, less ton 23.95c. Add 0.5c for max 0.03% Ca grade. Deduct 0.5c for max 1% Fe grade analyzing min 99.75% Si; 0.75c for max 1.25% Fe grades analyzing min 96.75% Si. Spot, add 0.25c.

Alsifer: (Approx 20% Al, 40% Si, 40% Fe). Contract, basis f.o.b. Niagara Falls, N. Y., lump, carload, bulk, 10.65c per lb of alloy; ton lot, packed, 11.8c.

ZIRCONIUM ALLOYS

12-15% Zirconium Alloy: (Zr 12-15%, Si 39-43%, C 0.20% max). Contract, c.l. lump, bulk 9.25c per lb of alloy. Packed, c.l. 10.45c, ton lot 11.6c, less ton 12.45c. Delivered. Spot, add 0.25c.

35-40% Zirconium Alloy: (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max). Contract, carload, lump, packed 27.25c per lb of alloy, ton lot 28.4c, less ton 29.65c. Freight allowed. Spot, add 0.25c.

BORON ALLOYS

Ferroboron: (B 17.50% min, Si 1.50% max, Al 0.50% max, C 0.50% max). Contract, 100 lb or more 1" x D, $1.20 per lb of alloy; less than 100 lb $1.30. Delivered. Spot, add 5c. F.o.b. Washington, Pa., prices, 100 lb and over, are as follows: Grade A (10-14% B) 85c per lb; Grade B (14-18% B) $1.20; Grade C (19% min B) $1.50.

Borosil: (3 to 4% B, 40 to 45% Si). Carload, bulk, lump, or 3" x D, $5.25 per lb of contained B. Packed, carload $5.40, ton to c.l. $5.50, less ton $5.60. Delivered.

Bortam: (B 1.5-1.9%. Ton lot, 45c per lb; less than ton lot, 50c per lb.

Carbortam: (1 to 2%. Contract, lump, carload 9.50c per lb f.o.b. Suspension Bridge, N. Y., freight allowed same as high-carbon ferrotitanium.

CALCIUM ALLOYS

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18% and Si 53-59%). Contract, carload, lump, bulk 23c per lb of alloy, carload packed 24.25c, ton lot 26.15c, less ton 27.15c. Delivered. Spot, add 0.25c.

Calcium-Silicon: (Ca 30-33%, Si 60-65%, Fe 1.5-3%). Contract, carload, lump, bulk 24c per lb of alloy, carload packed 25.65c, ton lot 27.95c, less ton 29.45c. Delivered. Spot, add 0.25c.

BRIQUETTED ALLOYS

Chromium Briquets: (Weighing approx 3⅝ lb each and containing 2 lb of Cr). Contract, carload, bulk 19c per lb of briquet, carload packed in box pallets 19.2c, in bags 20.1c; 3000 lb to c.l. in box pallets 20.4c; 2000 lb to c.l. in bags, 21.3c; less than 2000 lb in bags 22.2c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Ferromanganese Briquets: (Weighing approx 3 lb and containing 2 lb of Mn). Contract, carload, bulk 14.8c per lb of briquet; c.l., packed, pallets 15c, bags 16c; 3000 lb to c.l., pallets 16.2c; 2000 lb to c.l. bags, 17.2c; less ton 18.1c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx 3½ lb and containing 2 lb of Mn and approx ½ lb of Si). Contract, c.l. bulk 15.1c per lb of briquet; c.l. packed, pallets, 15.3c; bags 16.3c, 3000 lb to c.l., pallets, 16.5c; 2000 lb to c.l., bags 17.5c; less ton 18.4c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicon Briquets: (Large size—weighing approx 5 lb and containing 2 lb of Si). Contract, carload, bulk 7.7c per lb of briquet; packed, pallets, 7.9c; bags 8.9c; 3000 lb to c.l., pallets 9.5c; 2000 lb to c.l. bags 10.5c; less ton 11.4c. Delivered. Spot, add 0.25c. (Small size—weighing approx 2½ lb and containing 1 lb of Si). Carload, bulk 7.85c. Packed, pallets 8.05c; bags 9.05c; 2000 lb to c.l. pallets 9.65c; 2000 lb to c.l. bags 10.65c; less ton 11.55c. Delivered. Add 0.25c for notching, small size only. Spot, add 0.25c.

Molybdic-Oxide Briquets: (Containing 2½ lb of Mo each). $1.41 per pound of Mo contained, f.o.b. Langeloth, Pa.

TUNGSTEN ALLOYS

Ferrotungsten: (70-80%). 5000 lb W or more $2.95 per lb of contained W; 2000 lb W to 5000 lb W, $3.05; less than 2000 lb W, $3.17. Delivered.

OTHER FERROALLOYS

Ferrocolumbium: (Cb 50-60%, Si 8% max, C 0.4% max). Contract, ton lot 2" x D, $4.90 per lb of contained Cb. Delivered. Spot, add 10c.

Ferrotantalum—Columbium: (Cb 40% approx, Ta 20% approx, and Cb plus Ta 60% min, C 0.30% max). Ton lot 2" x D, $4.25 per lb of contained Cb plus Ta, delivered; less ton lot $4.30.

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr 5.7%, Fe 20% approx). Contract, c.l. packed ½-in. x 12 M 19c per lb of alloy, ton lot 20.15c, less ton 21.4c. Delivered. Spot, add 0.25c.

Graphidox No. 5: (Si 48-52%, Ca 5.7%, Ti 9-11%). C.l. packed, 19c per lb of alloy, ton lot 20.15c; less ton lot 21.4c, f.o.b. Niagara Falls, N. Y.; freight allowed to St. Louis.

V-5 Foundry Alloy: (Cr 38-42%, Si 17-19%, Mn 8-11%). C.l. packed 18.1c per lb of alloy; ton lot 19.55c; less ton lot 20.8c, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis.

Simanal: (Approx 20% each Si, Mn, Al; bal Fe). Lump, carload, bulk 18.50c. Packed c.l. 19.50c, 2000 lb to c.l. 20.50c, less than 2000 lb 21c per lb of alloy. Delivered.

Ferrophosphorus: (23.25% based on 24% P content with unitage of $4 for each 1% of P above or below the base); carload, f.o.b. sellers' works. Mt. Pleasant, Siglo, Tenn., $110 per gross ton.

Ferromolybdenum: (55-75%). Per lb of contained Mo, in 200-lb container, f.o.b. Langeloth and Washington, Pa., $1.68 in all sizes except powdered which is $1.74.

Technical Molybdic-Oxide: Per lb of contained Mo, in cans, $1.39; in bags, $1.38, f.o.b. Langeloth and Washington, Pa.

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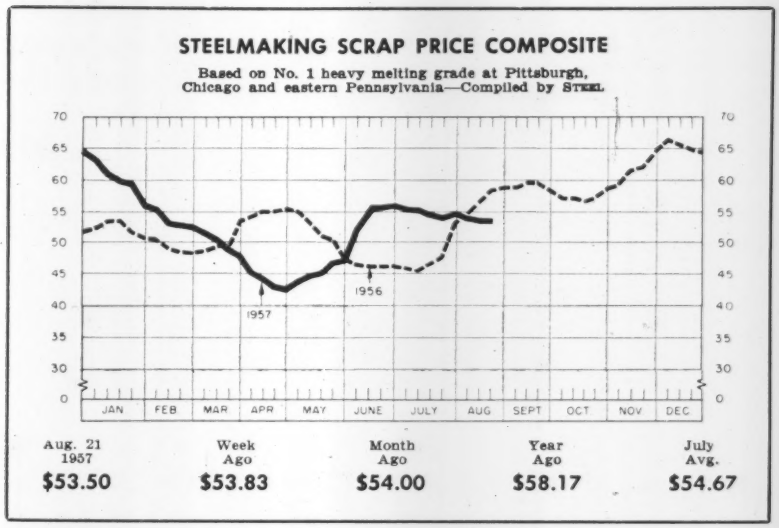

Scrap Prices Ease in Dull Market

Mills refrain from placing large tonnage orders and are noncommittal on buying plans. STEEL's composite price for No. 1 heavy melting slips to $53.50

Scrap Prices, Page 124

Chicago—Scrap prices here have declined $1 to $3 a ton. With mills declining to buy additional tonnages at these lower prices, there is some question as to whether the market can be held. In some instances, sales to mills at present prices, particularly for railroad grades, represent losses to brokers of up to $5 a ton.

During the last month, a certain amount of speculative buying has been done against the prospect of a substantially higher steelmaking rate in the fourth quarter. Scrap prices in this district are back to about what they were in late June and early July.

Philadelphia—While demand for steel scrap for export is brisk with supplies well depleted at Philadelphia yards, prices are lower in covering for new boats. No. 1 heavy melting steel is $53 to $54, delivered dock, Port Richmond, compared with $56 which was paid for recent cargoes. Of current sales tonnages, about 60 per cent are No. 1 heavy melting; the balance, No. 2. Some No. 2 bundles will be included for loading shortly. Domestic mill demand lags with prices unchanged except for turnings (off $1 a ton). Railroad specialties are firmer against recent lists offered.

New York—Except for machine shop and mixed borings and turnings ($1 a ton lower), steel and cast scrap prices are unchanged. Domestic shipments are light, notably to foundries, because consumers are keeping a close control on raw material stocks.

Buying for export is active. Prices paid for heavy melting steel, f.a.s. within short freight haul to dock, average close to $2 a ton higher than brokers' quotations for domestic shipment.

With practically no sales recorded in the East, some buying of 18-8 stainless grades in the Midwest are being negotiated on a progressively lower price scale.

Buffalo—The scrap market here was quiet last week following the placing of new mill orders. The price tone was steady despite reports of weakness in some outside markets.

Current mill orders carry through until the end of the month, and little price change is expected during that period. A fair amount of specialty business is being transacted, but over-all activity in the market is dull.

A test for the local market is expected shortly after Labor Day when mills will give some indication as to how they plan to buy scrap for the fall season.

Pittsburgh—A lack of new orders by mills has not lowered prices paid for scrap. Although buying of such grades as machine shop turnings is slack, firms which attempt to purchase them at reduced prices meet stiff resistance. There is a definite feeling of strength in prices. Although they could move downward in response to lower prices in neighboring areas, observers believe they will be higher when demand picks up in the fourth quarter.

Cleveland—Activity in the scrap market here last week was confined to a small sale of No. 2 bundles at $45 to a local mill. Mills are noncommittal on their plans for covering future needs. Brokers believe the market could move in either direction on the next buying wave.

Cincinnati—Scrap prices continue steady. But there is no new buying to provide a test. Brokers are filling old orders and anticipate no new business before the first of September. Foundry grades are showing signs of softening on lower operations by casters.

Detroit — Dealers and brokers are standing pat, but they expect to see a drop in prices when the next auto lists appear. Dealers' yards are overstocked, and steel mills aren't buying. A few sales have been reported at Hamilton, Ont.

Youngstown — Activity in the market here continues dull. Scrap dealers and buyers are trying to guess which way the market will go. There is some selling of No. 1 heavy melting scrap at $56 per gross ton on a recently placed order. There has been no recent order for No. 2 scrap. The biggest volume of No. 2 scrap in three years has piled up in dealers' yards. It is relatively high priced scrap, and dealers will be reluctant to let it go at too great a sacrifice.

Birmingham—Scrap movements in this district are light. Consumers and dealers seem determined to hold the price line. Consumers

(*Please turn to Page* 129)

Iron and Steel Scrap

Consumer prices, per gross ton, except as otherwise noted, including broker's commission, as reported to STEEL, Aug. 21, 1957. *Changes shown in italics.*

STEELMAKING SCRAP COMPOSITE

Aug. 21	$53.50
Aug. 14	53.83
July Avg.	54.67
Aug. 1956	57.13
Aug. 1952	43.00

Based on No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania.

PITTSBURGH

No. 1 heavy melting	55.00-56.00
No. 2 heavy melting	47.00-48.00
No. 1 factory bundles	63.00-64.00
No. 1 dealer bundles	55.00-56.00
No. 2 bundles	45.00-46.00
No. 1 busheling	55.00-56.00
Machine shop turnings	33.00-34.00
Mixed borings, turnings	33.00-34.00
Short shovel turnings	37.00-38.00
Cast iron borings	37.00-38.00
Cut Structurals:	
2 ft and under	63.00-64.00
3 ft lengths	62.00-63.00
Heavy turnings	50.00-51.00
Punchings & plate scrap	62.00-63.00
Electric furnace bundles	62.00-63.00

Cast Iron Grades

No. 1 cupola	49.00-50.00
Heavy breakable cast	47.00-48.00
Unstripped motor blocks	36.00-37.00
No. 1 machinery cast	59.00-60.00

Railroad Scrap

No. 1 R.R. heavy melt.	64.00-65.00
Rails, 2 ft and under	75.00-76.00
Rails, 18 in. and under	76.00-77.00
Rails, random lengths	73.00-74.00
Railroad specialties	72.00-73.00

Stainless Steel Scrap

18-8 bundles & solids	300.00-315.00
18-8 turnings	190.00-215.00
430 bundles & solids	80.00-85.00
430 turnings	55.00-60.00

CLEVELAND

No. 1 heavy melting	52.00-53.00
No. 2 heavy melting	44.00-45.00
No. 1 factory bundles	57.00-58.00
No. 1 bundles	52.00-53.00
No. 2 bundles	*44.00-45.00*
No. 1 busheling	52.00-53.00
Machine shop turnings	23.00-24.00
Short shovel turnings	27.00-28.00
Mixed borings, turnings	27.00-28.00
Cast iron borings	27.00-28.00
Cut foundry steel	55.00-56.00
Cut structurals, plates 2 ft and under	63.00-64.00
Low phos. punchings & plate	53.00-54.00
Alloy free, short shovel turnings	30.00-31.00
Electric furnace bundles	53.00-54.00

Cast Iron Grades

No. 1 cupola	53.00-54.00
Charging box cast	43.00-44.00
Heavy breakable cast	41.00-42.00
Stove plate	50.00-51.00
Unstripped motor blocks	37.00-38.00
Brake shoes	41.00-42.00
Clean auto cast	54.00-55.00
Burnt cast	39.00-40.00
Drop broken machinery	56.00-57.00

Railroad Scrap

No. 1 R.R. heavy melt.	57.00-58.00
R.R. malleable	61.00-62.00
Rails, 2 ft and under	75.00-76.00
Rails, 18 in. and under	76.00-77.00
Rails, random lengths	68.00-69.00
Cast steel	66.00-67.00
Railroad specialties	68.00-69.00
Uncut tires	63.00-64.00
Angles, splice bars	68.00-69.00
Rails, rerolling	73.00-74.00

Stainless Steel
(Brokers' buying prices; f.o.b. shipping point)

18-8 bundles, solids	280.00-290.00
18-8 turnings	180.00-190.00
430 clips, bundles, solids	75.00-80.00
430 turnings	40.00-50.00

YOUNGSTOWN

No. 1 heavy melting	55.00-56.00
No. 2 heavy melting	48.00-49.00
No. 1 bundles	55.00-56.00
No. 2 bundles	45.00-46.00
No. 1 busheling	55.00-56.00
Machine shop turnings	23.00-24.00
Short shovel turnings	29.00-30.00
Cast iron borings	29.00-30.00
Low phos.	58.00-59.00
Electric furnace bundles	58.00-59.00

Railroad Scrap

No. 1 R.R. heavy melt.	62.00-63.00

CHICAGO

No. 1 heavy melt., indus.	*54.00-55.00*
No. 1 hvy melt., dealer	*51.00-52.00*
No. 2 heavy melting	*44.00-45.00*
No. 1 factory bundles	*57.00-58.00*
No. 1 dealer bundles	*52.00-53.00*
No. 2 bundles	*39.00-40.00*
No. 1 busheling, indus.	*54.00-55.00*
No. 1 busheling, dealer	*51.00-52.00*
Machine shop turnings	*33.00-34.00*
Mixed borings, turnings	*35.00-36.00*
Short shovel turnings	*35.00-36.00*
Cast iron borings	*35.00-36.00*
Cut structurals, 3 ft.	*56.00-57.00*
Punching & plate scrap	*57.00-58.00*

Cast Iron Grades

No. 1 cupola	*46.00-47.00*
Stove plate	*44.00-45.00*
Unstripped motor blocks	*34.00-35.00*
Clean auto cast	*52.00-53.00*
Drop broken machinery	*52.00-53.00*

Railroad Scrap

No. 1 R.R. heavy melt.	*56.00-57.00*
R.R. malleable	*60.00-61.00*
Rails, 2 ft and under	*74.00-75.00*
Rails, 18 in. and under	*75.00-76.00*
Angles, splice bars	*67.00-68.00*
Rails, rerolling	*74.00-75.00*

Stainless Steel Scrap

18-8 bundles & solids	*275.00-285.00*
18-8 turnings	*175.00-185.00*
430 bundles & solids	80.00-85.00
430 turnings	65.00-70.00

DETROIT

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	51.00-52.00
No. 2 heavy melting	44.00-45.00
No. 1 bundles	52.00-53.00
No. 2 bundles	38.00-39.00
No. 1 busheling	51.00-52.00
Machine shop turnings	27.00-28.00
Mixed borings, turnings	28.00-29.00
Short shovel turnings	29.00-30.00
Punchings & plate scrap	56.00-58.00

Cast Iron Grades

No. 1 cupola	51.00
Charging box cast	43.00
Stove plate	44.00
Heavy breakable	42.00
Unstripped motor blocks	30.00-31.00
Clean auto cast	52.00
Malleable	53.00†

†Nominal

ST. LOUIS

(Brokers' buying prices)

No. 1 heavy melting	49.50
No. 2 heavy melting	47.00
No. 1 bundles	49.50
No. 2 bundles	42.00
No. 1 busheling	49.50
Machine shop turnings	*34.00*
Short shovel turnings	*36.00*

Cast Iron Grades

No. 1 cupola	48.00
Charging box cast	42.00
Heavy breakable cast	42.00
Unstripped motor blocks	44.00
Brake shoes	40.00
Clean auto cast	48.00
Stove plate	44.00

Railroad Scrap

No. 1 R.R. heavy melt.	57.00
Rails, 18 in. and under	77.00
Rails, random lengths	70.00
Rails, rerolling	78.00
Angles, splice bars	63.00

PHILADELPHIA

No. 1 heavy melting	52.00
No. 2 heavy melting	46.00
No. 1 bundles	53.00
No. 2 bundles	43.50
No. 1 busheling	53.00
Electric furnace bundles	56.00-57.00
Mixed borings, turnings	37.00
Short shovel turnings	*37.00-38.00*
Machine shop turnings	*34.00-35.00*
Heavy turnings	48.00
Structurals & plate	58.00-59.00
Couplers, springs, wheels	*67.50-68.00*
Rail crops, 2 ft & under	69.00-71.00

Cast Iron Grades

No. 1 cupola	47.00
Heavy breakable cast	53.00
Malleable	62.00†
Drop broken machinery	57.00

†Nominal

NEW YORK

(Brokers' buying prices)

No. 1 heavy melting	50.00-51.00
No. 2 heavy melting	41.00-42.00
No. 1 bundles	50.00-51.00
No. 2 bundles	38.50-39.00
Machine shop turnings	*25.00-26.00*
Mixed borings, turnings	*26.00-27.00*
Short shovel turnings	29.00-30.00
Low phos. (structural & plate	53.00-54.00

Cast Iron Grades

No. 1 cupola	46.00-47.00
Unstripped motor blocks	39.00-40.00
Heavy breakable	46.00-47.00

Stainless Steel

18-8 sheets, clips, solids	*250.00-255.00*
18-8 borings, turnings	*150.00-155.00*
430 sheets, clips, solids	60.00-70.00
410 sheets, clips, solids	50.00-55.00

BOSTON

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	41.00-42.00
No. 2 heavy melting	35.00-36.00
No. 1 bundles	41.00-42.00
No. 2 bundles	34.00-34.50
No. 1 busheling	41.00-42.00
Machine shop turnings	24.00-25.00
Mixed borings, turnings	27.00-28.00
Short shovel turnings	28.00-29.00
No. 1 cast	34.00-35.00
Mixed cupola cast	33.00-34.00
No. 1 machinery cast	42.00-43.00

BUFFALO

No. 1 heavy melting	49.00-50.00
No. 2 heavy melting	42.50-43.50
No. 1 bundles	49.00-50.00
No. 2 bundles	39.50-40.50
No. 1 busheling	49.00-50.00
Mixed borings, turnings	33.00-34.00
Machine shop turnings	31.00-32.00
Short shovel turnings	34.00-35.00
Cast iron borings	33.00-34.00
Low phos.	55.00-56.00

Cast Iron Grades (F.o.b. shipping point)

No. 1 cupola	48.00-49.00
No. 1 machinery	53.00-54.00

Railroad Scrap

Rails, random lengths	61.00-62.00
Rails, 3 ft and under	66.00-67.00
Railroad specialties	59.00-60.00

CINCINNATI

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	52.00-53.00
No. 2 heavy melting	46.00-47.00
No. 1 bundles	52.00-53.00
No. 2 bundles	41.00-42.00
No. 1 busheling	52.00-53.00
Machine shop turnings	33.00-34.00
Mixed borings, turnings	30.00-31.00
Short shovel turnings	36.00-37.00
Cast iron borings	30.00-31.00
Low phos. 18 in.	59.00-60.00

Cast Iron Grades

No. 1 cupola	45.00-46.00
Heavy breakable cast	42.00-43.00
Charging box cast	42.00-43.00
Drop broken machinery	55.00-56.00

Railroad Scrap

No. 1 R.R. heavy melt.	56.00-57.00
Rails, 18 in. and under	71.00-72.00
Rails, random lengths	64.00-65.00

BIRMINGHAM

No. 1 heavy melting	49.00-50.00
No. 2 heavy melting	39.00-40.00
No. 1 bundles	49.00-50.00
No. 2 bundles	*35.00-36.00*
No. 1 busheling	49.00-50.00
Cast iron borings	27.00-28.00
Short shovel turnings	40.00-41.00
Machine shop turnings	39.00-40.00
Bar crops and plates	*56.00-57.00*
Structurals & plate	55.00-56.00
Electric furnace bundles	51.00-52.00
Electric furnace:	
3 ft and under	49.00-50.00
2 ft and under	50.00-51.00

Cast Iron Grades (F.o.b. shipping point)

No. 1 cupola	54.00-55.00
Stove plate	54.00-55.00
Unstripped motor blocks	45.00-46.00
Charging box cast	37.00-38.00
No. 1 wheels	46.00-47.00

Railroad Scrap

No. 1 R.R. heavy melt.	55.00-56.00
Rails, 18 in. and under	69.00-70.00
Rails, rerolling	77.00-78.00
Rails, random lengths	*64.00-65.00*
Angles, splice bars	60.00-61.00

SEATTLE

No. 1 heavy melting	*44.00*
No. 2 heavy melting	*42.00*
No. 1 bundles	*42.00*
No. 2 bundles	*28.00*
Machine shop turnings	29.00
Mixed borings, turnings	29.00
Electric furnace No. 1	50.00

Cast Iron Grades

No. 1 cupola	40.00
Heavy breakable cast	37.00
Unstripped motor blocks	32.50
Stove plate (f.o.b. plant)	30.00

LOS ANGELES

No. 1 heavy melting	46.00
No. 2 heavy melting	43.00
No. 1 bundles	45.00
No. 2 bundles	38.00
Machine shop turnings	32.00
Shoveling turnings	34.00
Cast iron borings	32.00
Cut structural and plate, 1 ft and under	61.00

Cast Iron Grades (F.o.b. shipping point)

No. 1 cupola	53.00

Railroad Scrap

No. 1 R.R. heavy melt.	46.00

SAN FRANCISCO

No. 1 heavy melting	47.00
No. 2 heavy melting	45.00
No. 1 bundles	46.00
No. 2 bundles	35.00
Machine shop turnings	32.00
Mixed borings, turnings	32.00
Cast iron borings	32.00
Heavy turnings	32.00
Short shovel turnings	32.00
Cut structurals, 3 ft	56.00

Cast Iron Grades

No. 1 cupola	53.00-54.00
Charging box cast	45.00-47.00
Stove plate	46.00
Heavy breakable cast	40.00
Unstripped motor blocks	43.00
Clean auto cast	55.00
No. 1 wheels	48.00
Drop broken machinery	53.00

HAMILTON, ONT.

No. 1 heavy melting	50.00
No. 2 heavy melting	45.00
No. 1 bundles	50.00
No. 2 bundles	39.00
Mixed steel scrap	47.00
Mixed borings, turnings	24.00
Busheling, new factory: Prepared	50.00
Unprepared	44.00
Short steel turnings	30.00
Rails, rerolling	61.00

Cast Iron Grades†

No. 1 machinery cast	50.00

†F.o.b. Hamilton, Ont.

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For over half a century our experience, personnel, equipment and key office locations have contributed to the steady growth of the iron and steel industry. Possibly our facilities may help you solve a problem in iron or steel scrap—no matter how big or small.
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Metals Show Some Gains

Lead, zinc, and copper sales have improved recently, but the market is still weak. Hopes appear dim that Congress will enact any tariff legislation this year

Nonferrous Metal Prices, Pages 128 & 129

"WEAK, but improving" sums up the current status of lead, zinc, and copper. Metalsmen are hopeful that the nonferrous industry may be pulling out of its slump, but they are quick to point out overproduction, foreign imports, and spotty sales still keep the domestic market at low levels.

Lead—The picture is brightest here. Producers say the market has firmed recently because of an upswing in new orders. There's a growing feeling the lead price (14 cents a pound) may have hit bottom.

Zinc—Some pickup is noted, but consumers are still buying to meet current needs rather than to replenish inventories. Galvanizing sales are reported to be a little better than they were. Brass mill shipments stay about the same. One observer says sales to diecasters show signs of strengthening considerably.

Most producers think the present price (10 cents a pound) will hold. Some even say the anticipated fourth quarter upswing could jack up the current quotation.

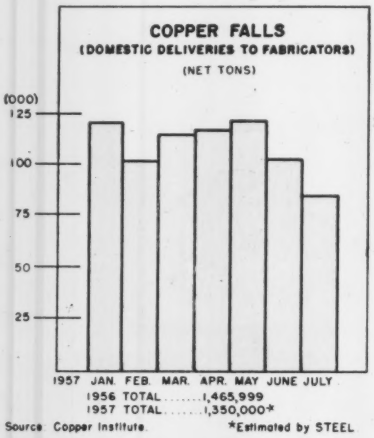
The wave of production cutbacks continues. New Jersey Zinc Co. has halted operations at its Sterling Mine, Ogdensburg, N. J.

Copper—Demand has improved recently though the over-all picture is still one of weakness (see chart). Producers report a pickup from auto firms, brass mills, and tube mills. But it's still too early to tell if this is anything but a temporary upswing.

Buyers still don't have enough faith in the metal's stability to come into the market for substantial tonnages. Further weakening copper's position is the increasing amount of unsold production. Domestic refined stocks rose 25,966 tons in July—now stand at 191,515 tons. Some metalsmen believe if there isn't a spurt in demand in the next few weeks, further production slashes will be in order.

Tariff Bill Out?

Producers counting on congressional action to help firm lead and zinc prices seem assured of disappointment. Consensus is that any relief for the industry will come from the administration.



On Aug. 16 the Senate Finance Committee voted to raise present tariffs on both metals to 3 cents a pound. But on Aug. 20, the committee backed down from this proposal and agreed to support the administration bill which would impose a sliding scale of excise taxes on imports when prices fall below stated peril points. In probably the most meaningful development, the House Ways & Means Committee sent a letter to the President suggesting that he personally review the present lead and zinc situation from the standpoint of his power to alleviate it through recommendations to the Tariff Commission and the Office of Defense Mobilization.

The House letter seems to bear out the feeling there will be no congressional action, at least for this year. Most immediate relief would come if the President ordered the ODM to increase its stockpile program since the Tariff Commission usually takes at least six months to act on a recommendation.

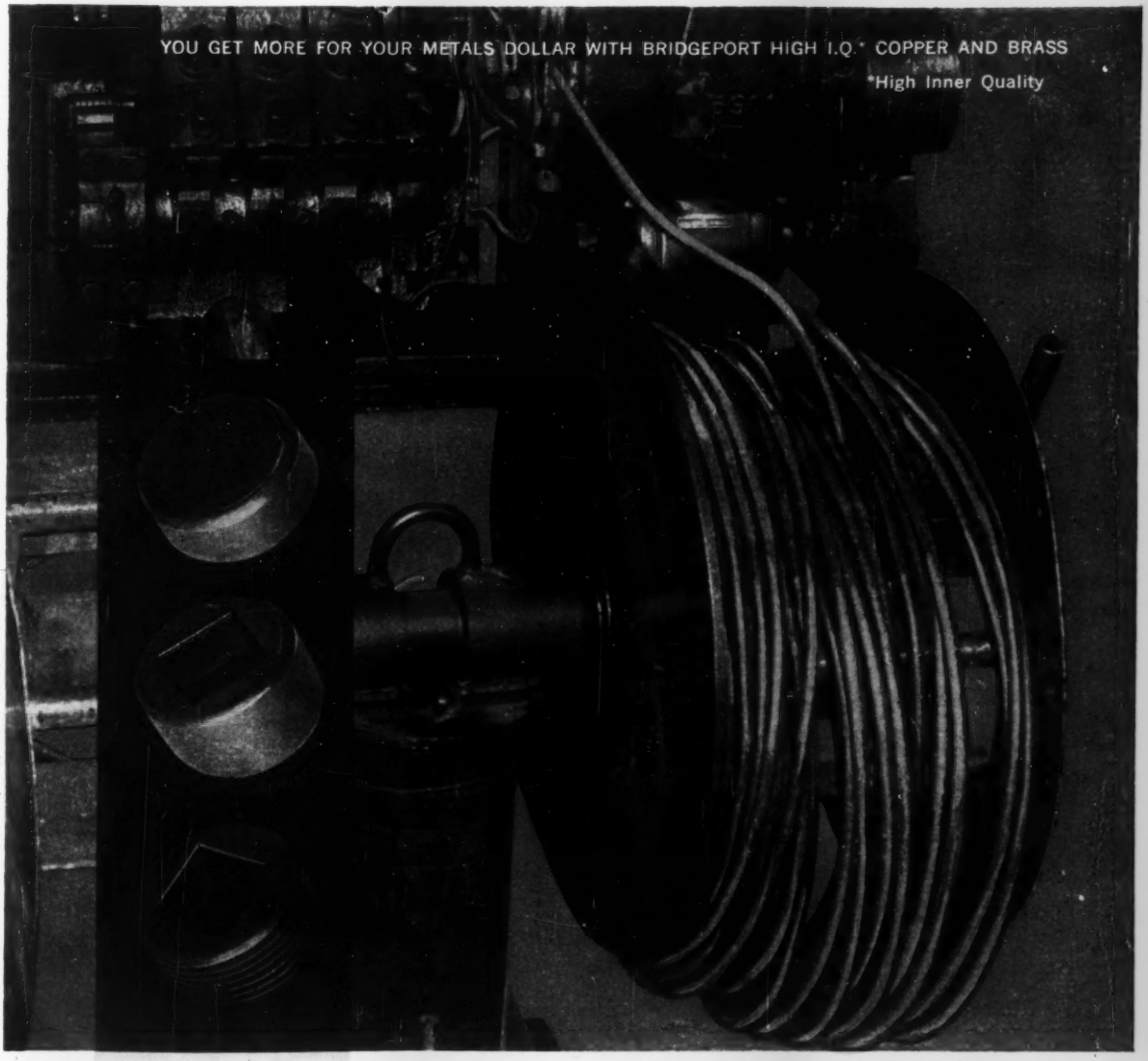
Market Memos

- The government's Painesville, Ohio, electrolytic magnesium smelter will be auctioned off on Sept. 12, reports the General Services Administration. Capacity is 18,000 tons a year. GSA previously had rejected two bids for the 30-acre facility.
- Aluminum Co. of America will close its East St. Louis, Ill., alumina facilities on Nov. 1. The plant will continue to produce aluminum fluoride, cryolite, and other chemical products.
- Anaconda Co. reports first half profits were $27,697,515, a drop of $33,636,613 from the $61,334,128 earned in the same period of 1956.

NONFERROUS PRICE RECORD

	Price Aug. 21	Last Change	Previous Price	July Avg	June Avg	Aug., 1956 Avg
Aluminum ..	28.10	Aug. 1, 1957	27.10	27.100	27.100	26.700
Copper	27.75–28.50	Aug. 21, 1957	28.25–28.50	28.822	30.250	39.750
Lead	13.80	June 11, 1957	14.80	13.800	14.120	15.800
Magnesium .	35.25	Aug. 13, 1956	33.75	35.250	35.250	34.694
Nickel	74.00	Dec. 6, 1956	64.50	74.000	74.000	64.500
Tin	94.25	Aug. 20, 1957	94.375	96.576	98.080	99.043
Zinc	10.00	July 1, 1957	10.50	10.000	10.840	13.500

Quotations in cents per pound based on: COPPER, deld. Conn. Valley; LEAD, common grade, deld. St. Louis; ZINC, prime western, E. St. Louis; TIN, Straits, deld. New York; NICKEL, electrolytic cathodes, 99.9%, base size at refinery, unpacked; ALUMINUM, primary ingots, 99 + %, deld.; MAGNESIUM, pig, 99.8%, Velasco, Tex.



Progressive steps in the manufacture of a Pittsburgh Plug from Bridgeport Wire. Part is cut off, upset to form a tapered blank and roll threaded.

Easy on the dies... Bridgeport cold heading wire

The pipe plugs illustrated are just one of many different cold headed and cold rolled products made by Pittsburgh Plug & Products Co., Pittsburgh, Pa. When you're producing products such as these in such variety and in large volume, you have to be mighty careful on materials specifications. You need an alloy that not only readily cold forms but which will hold prescribed tolerances at high production rates. Otherwise, scrap losses and rejects mount up.

The answer in this case was Bridgeport Yellow Brass Wire, Alloy #16, the most popular and versatile of Bridgeport cold heading wires. Used in a scrapless nut former which makes possible a materials savings in excess of 40%, Alloy #16 meets all the requirements of the job which calls for wire to a prescribed OD with rigid tolerance specifications.

Yellow Brass Wire is just one of the many Bridgeport alloys for cold heading. It will pay you to check with your local Bridgeport Sales Office for help in selecting the alloy best suited to your production and product method. Our Service is prompt, dependable, backed by Bridgeport's Technical Service.

matched Bridgeport Brass Alloys *to your job*

BRIDGEPORT BRASS

Offices in Principal Cities • Conveniently Located Warehouses

Bridgeport Brass Company, Bridgeport 2, Connecticut
In Canada: Noranda Copper and Brass Ltd., Montreal

Nonferrous Metals

Cents per pound, carlots except as otherwise noted.

PRIMARY METALS AND ALLOYS

Aluminum: 99.5%, pigs, 26.00; ingots, 28.10, 10 000 lb or more, f.o.b. shipping point. Freight allowed on 500 lb or more.

Aluminum Alloy: No. 13, 29.90; No. 43, 29.70; No. 195, 31.30; No. 241, 31.50; No. 356, 29.90, 30-lb ingots.

Antimony: R.M.M. brand, 99.5%, 33.00; Lone Star brand, 33.50, f.o.b. Laredo, Tex., in bulk. Foreign brands, 99.5%, 27.50-28.00, New York, duty paid, 10.000 lb or more.

Beryllium: 97%, lump or beads, $71.50 per lb, f.o.b. Cleveland or Reading, Pa.

Beryllium Aluminum: 5% Be, $74.75 per lb of contained Be, with balance as Al at market price, f.o.b. shipping point.

Beryllium Copper: 3.75-4.25% Be, $43 per lb of contained Be, with balance as Cu at market price on shipment date, f.o.b. shipping point.

Bismuth: $2.25 per lb, ton lots.

Cadmium: Sticks and bars, $1.70 per lb deld.

Cobalt: 97-99%, $2.00 per lb for 550-lb keg; $2.02 per lb for 100-lb case; $2.07 per lb under 100 lb.

Columbium: Powder, $120 per lb, nom.

Copper: Electrolytic, 28.50 deld.; custom smelters, 27.75; lake, 28.50 deld.; fire refined, 28.25 deld.

Germanium: First reduction, $179.17-197.31 per lb; intrinsic grade, $197.31-220 per lb, depending on quantity.

Gold: U.S. Treasury, $35 per oz.

Indium: 99.9%, $2.25 per troy oz.

Iridium: $100-110 nom. per troy oz.

Lead: Common, 13.80; chemical, 13.90; corroding, 13.90, St. Louis, New York basis, add 0.20.

Lithium: 98+%, cups or ingots, $11.50; rod, $13.50; shot or wire, $14.50, f.o.b. Minneapolis, 100 lb lots.

Magnesium: Pig, 35.25; ingot, 36.00 f.o.b. Velasco, Tex.; 12 in. sticks, 59.00 f.o.b. Madison, Ill.

Magnesium Alloys: AZ91A (diecasting), 37.25 deld.; AZ63A, AZ92A, AZ91C (sand casting), 40.75, f.o.b. Velasco, Tex.

Mercury: Open market, spot, New York, $250-252 per 76-lb flask.

Molybdenum: Unalloyed, turned extrusions, 3.75-5.75 in. round, $9.60 per lb in lots of 2500 lb or more, f.o.b. Detroit.

Nickel: Electrolytic cathodes, sheets (4 x 4 in. and larger), unpacked, 74.00; 10-lb pigs, unpacked, 78.25; "XX" nickel shot, 79.50; "F" nickel shot for addition to cast iron, 74.50; "F" nickel 5 lb ingots in kegs for addition to cast iron, 75.50. Prices f.o.b. Port Colborne, Ont., including import duty. New York basis, add 1.01. Nickel oxide sinter, 71.25 per lb of nickel content before 1 cent freight allowance, f.o.b. Copper Cliff, Ont.

Osmium: $80-100 per troy oz, nom.

Palladium: $21-22.50 per troy oz.

Platinum: $82-87 per troy oz from refineries.

Radium: $16-21.50 per mg radium content, depending on quantity.

Rhodium: $118-125 per troy oz.

Ruthenium: $45-55 per troy oz.

Selenium: $10.50 per lb, commercial grade.

Silver: Open market, 90.875 per troy oz.

Sodium: 16.50, c.l.; 17.00 l.c.l.

Tantalum: Rod, $60 per lb; sheet, $55. per lb.

Tellurium: $1.65-1.75 per lb.

Thallium: $12.50 per lb.

Tin: Straits, N. Y., spot, 94.25; prompt, 94.125.

Titanium: Sponge, 99.3+%, grade A-1 ductile (0.3% Fe max.), $2.25; grade A-2 (0.5% Fe max.), $2.00 per lb.

Tungsten: Powder, 98.8%, carbon reduced, 1000-lb lots, $3.50 per lb nom., f.o.b. shipping point; less than 1000 lb add 15.00; 99+% hydrogen reduced, $4.10-4.20.

Zinc: Prime Western, 16.00; brass special, 16.25; intermediate, 16.50. East St. Louis, freight allowed over 0.50 per lb. New York basis, add 0.50. High grade, 11.35; special high grade, 11.75 deld. Die casting alloy ingot No. 3, 14.25; No. 2, 15.25; No. 5, 14.75 deld.

Zirconium: Sponge, commercial grade, $5-10 per lb.

(Note: Chromium, manganese and silicon metals are listed in ferroalloy section.)

SECONDARY METALS AND ALLOYS

Aluminum Ingot: Piston alloys, 24.75-30.25; No. 12 foundry alloy (No. 2 grade), 22.75-23.00; 5% silicon alloy, 0.60 Cu max., 26.00-26.50; 13 alloy, 0.60 Cu max., 26.00-26.50; 195 alloy, 25.75-26.75; 108 alloy, 23.25-23.50. Steel deoxidizing grades, notch bars, granulated or shot; Grade 1, 24.50; grade 2, 22.75; grade 3, 21.75; grade 4, 20.75.

Brass Ingot: Red brass, No. 115, 29.50; tin bronze, No. 225, 39.00; No. 245, 33.50; high-leaded tin bronze, No. 305, 33.50; No. 1 yellow, No. 405, 24.00; manganese bronze, No. 421, 27.00.

Magnesium Alloy Ingot: AZ63A, 40.75; AZ91B, 37.25; AZ91C, 40.75; AZ92A, 40.75.

NONFERROUS PRODUCTS

BERYLLIUM COPPER

(Base prices per lb, plus mill extras, 2000 to 5000 lb; nom. 1.9% Be alloy.) Strip, $1.84, f.o.b. Temple, Pa., or Reading, Pa.; rod, bar, wire, $1.82, f.o.b. Temple, Pa.

COPPER WIRE

Bare, soft, f.o.b. eastern mills, 30.000-lb lots, 33.855; l.c.l., 34.48. Weatherproof, 30,000-lb lots, 35.16; l.c.l., 35.91. Magnet wire deld., 15,000 lb or more, 41.93; l.c.l., 42.68.

LEAD

(Prices to jobbers, f.o.b. Buffalo, Cleveland, Pittsburgh.) Sheets, full rolls, 140 sq ft or more, $19.50 per cwt; pipe, full coils, $19.50 per cwt; traps and bends, list prices plus 30%.

TITANIUM

(Prices per lb, 10.000 lb and over, f.o.b. mill.) Sheets and strip, $9.50-15.95; sheared mill plate, $8.00-11.50; wire, $7.50-11.50; forging billets, $6.00-7.60; hot-rolled and forged bars, $6.15-7.90.

ZINC

(Prices per lb, c.l., f.o.b. mill.) Sheets, 24.00; ribbon zinc in coils, 20.50; plates, 19.00.

ZIRCONIUM

Plate, $12.50-19.20; H.R. strip, $12.50-22.90; C.R. strip, $15.00-31.25; forged or H.R. bars, $11.00-17.40.

NICKEL, MONEL, INCONEL

	"A" Nickel	Monel	Inconel
Sheets, C.R.	126	106	128
Strip, C.R.	124	108	138
Plate, H.R.	120	105	121
Rod, Shapes, H.R.	107	89	109
Seamless Tubes	157	129	200

ALUMINUM

Sheets: 1100 and 3003 mill finish (30,000 lb base; freight allowed).

Thickness Range Inches	Flat Sheet	Coiled Sheet
0.249-0.136	43.10-47.60	....
0.135-0.096	43.60-48.70	40.50-41.10
0.095-0.077	44.30-50.50	40.60-41.30
0.076-0.061	44.90-52.80	40.80-42.00
0.060-0.048	45.60-55.10	41.40-43.10
0.047-0.038	46.20-57.90	41.90-44.50
0.037-0.030	46.60-62.90	42.30-46.30
0.029-0.024	47.20-54.70	42.60-47.00
0.023-0.019	48.20-58.10	43.70-45.40
0.018-0.017	49.00-55.40	44.30-46.00
0.016-0.015	49.90-56.30	45.10-46.80
0.014	50.90	46.10-47.80
0.013-0.012	52.10	46.80
0.011	53.10	48.00
0.010-0.0095	54.60	49.40
0.009-0.0085	55.90	50.90
0.008-0.0075	57.50	52.10
0.007	59.00	53.60
0.006	60.60	55.00

ALUMINUM (continued)

Plates and Circles: Thickness 0.250-3 in., 24-60 in. width or diam., 72-240 in. lengths.

Alloy	Plate Base	Circle Base
1100-F, 3003-F	42.70	47.50
5050-F	43.80	48.60
3004-F	44.80	50.50
5052-F	45.40	51.20
6061-T6	46.90	53.00
2024-T4*	50.60	57.40
7075-T6*	58.40	66.00

*24-48 in. width or diam., 72-180 in. lengths.

Screw Machine Stock: 30.000 lb base.

Diam. (in.) or across flats	—Round— 2011-T3	2017-T4	—Hexagonal— 2011-T3	2017-T4
Drawn				
0.125	78.20	75.20	....	....
0.156-0.172	66.20	63.40	....	....
0.188	66.20	62.40	....	81.60
0.219-0.234	63.00	61.50	....	....
0.250-0.281	63.00	61.50	....	77.90
0.313	63.00	61.50	....	74.20
0.344	62.50	....	....	....
Cold-Finished				
0.375-0.547	62.50	61.30	74.80	69.80
0.563-0.688	62.50	61.30	71.10	65.50
0.719-1.000	61.00	59.70	64.90	61.70
1.063	61.00	59.70	....	59.60
1.125-1.500	58.60	57.40	62.80	59.60
Rolled				
1.563	57.00	55.70	....	....
1.625-2.000	56.30	54.90	....	57.50
2.125-2.500	54.80	53.40	....	....
2.563-3.375	53.20	51.70	....	....

Forging Stock: Round, Class 1, 45.20-58.60 in specific lengths, 36-144 in., diam. 0.375-8 in. Rectangles and squares, Class 1, 50.50-66.60 in random lengths, 0.375-4 in. thick, width 0.750-10 in.

Pipe: ASA schedule 40, alloy 6063-T6, standard lengths, plain ends, 90,000-lb base, per 100 ft.

Nom. Pipe Size (in.)		Nom. Pipe Size (in.)	
¾	$19.40	2	$ 59.90
1	30.50	4	165.05
1¼	41.30	6	296.10
1½	49.40	8	445.55

Extruded Solid Shapes:

Factor	Alloy 6063-T5	Alloy 6062-T6
9-11	45.40-47.00	60.60-64.80
12-14	45.70-47.20	61.30-65.80
15-17	45.90-47.90	62.50-67.50
18-20	46.50-48.30	64.50-70.10

MAGNESIUM

Sheet and Plate: AZ31B standard grade, 0.32 in., 103.10; .081 in., 77.90; .125 in., 70.40; .188 in., 69.00; .250-2.0 in., 67.90. AZ31B spec. grade, .032 in., 171.30; .081 in., 108.70; .125 in., 98.10; .188 in., 95.70; .250-2.00 in., 93.30. Thread plate, .188 in., 71.70; .250-2.00 in., 70.60. Tooling plates, .250-3.0 in., 73.00

Extruded Solid Shapes:

Factor	Com. Grade (AZ31C)	Spec. Grade (AZ31B)
6-8	69.60-72.40	84.60-87.40
12-14	70.70-73.00	85.70-88.00
24-26	75.60-76.30	90.60-91.30
36-38	89.20-90.30	104.20-105.30

NONFERROUS SCRAP

DEALER'S BUYING PRICES

(Cents per pound, New York, in ton lots.)

Aluminum: 1100 clippings, 14.00-14.50; old sheets, 10.50-11.00; borings and turnings, 7.00-

BRASS MILL PRICES

	MILL PRODUCTS a				SCRAP ALLOWANCES f		
	Sheet, Strip, Plate	Rod	Wire	Seamless Tubes	Clean Heavy	Rod Ends	Clean Turnings
Copper	50.63b	47.86c	....	50.82	24.500	24.500	23.750
Yellow Brass	44.02	32.23d	44.56	46.93	18.375	18.125	16.625
Low Brass, 80%	46.70	46.64	47.24	49.51	20.750	20.500	20.000
Red Brass, 85%	47.64	47.58	48.18	50.45	21.500	21.250	20.750
Com. Bronze, 90%	49.13	49.07	49.67	51.69	22.375	22.125	21.625
Manganese Bronze	51.89	46.06	56.52	....	17.250	17.000	16.500
Muntz Metal	46.29	42.10	....	....	17.250	17.000	16.500
Naval Brass	48.19	42.50	55.25	51.60	17.000	16.750	16.250
Silicon Bronze	55.20	54.39	55.24	57.21e	24.000	23.750	23.000
Nickel Silver, 10%	60.41	62.74g	62.74	....	24.625	24.375	12.313
Phos. Bronze, A-5%	69.61	70.11	70.11	71.29	25.375	25.125	24.125

a. Cents per lb, f.o.b. mill; freight allowed on 500 lb or more. b. Hot-rolled. c. Cold-drawn. d. Free cutting. e. 3% silicon. f. Prices in cents per lb for less than 20,000 lb. f.o.b. shipping point. On lots over 20,000 lb at one time, of any or all kinds of scrap, add 1 cent per lb. g. Leaded

7.50; crankcases, 11.00-11.50; industrial castings, 11.00-11.50.

Copper and Brass: No. 1 heavy copper and wire, 20.50; No. 2 heavy copper and wire, 19.00-19.50; light copper, 17.00-17.50; No. 1 composition red brass, 18.50-19.00; No. 1 composition turnings, 18.00-18.50; yellow brass turnings, 10.75-11.25; new brass clippings, 17.00-17.50; light brass, 10.50-11.00; heavy yellow brass, 12.50-13.00; new brass rod ends, 14.50-15.00; auto radiators, unsweated, 13.50-14.00; cocks and faucets, 14.50-15.00; brass pipe, 15.50-16.00.

Lead: Heavy 9.50-10.00; battery plates, 4.25-4.50; linotype and stereotype, 11.50-12.00; electrotype, 10.00-10.50; mixed babbitt, 11.00-11.50.

Monel: Clippings, 45.00-50.00; old sheets, 44.00-50.00; turnings, 35.00-40.00; rods, 45.00-50.00.

Nickel: Sheets and clips, 75.00-80.00; rolled anodes, 75.00-80.00; turnings, 55.00-60.00; rod ends, 75.00-80.00.

Zinc: Old zinc, 3.00-3.25; new diecast scrap, 2.75-3.00; old diecast scrap, 1.50-1.75.

REFINERS' BUYING PRICES

(Cents per pound, carlots, delivered refinery)

Aluminum: 1100 clippings, 17.50-18.00; 3003 clippings, 17.50-18.00; 6151 clippings, 17.00-18.00; 5052 clippings, 17.00-17.50; 2014 clippings, 16.50-17.50; 2017 clippings, 16.50-17.50; 2024 clippings, 16.50-17.50; mixed clippings, 16.00-16.50; old sheets, 14.00-14.50; old cast, 14.00-14.50; clean old cable (free of steel), 17.00; borings and turnings, 14.50-16.00.

Beryllium Copper: Heavy scrap, 0.020-in. and heavier, not less than 1.5% Be, 55.00; light scrap, 50.00; turnings and borings, 35.00.

Copper and Brass: No. 1 heavy copper and wire, 23.75; No. 2 heavy copper and wire, 21.75; light copper, 19.50; refinery brass (60% copper) per dry copper content, 21.50.

INGOTMAKERS' BUYING PRICES

(Cents per pound, carlots, delivered)

Copper and Brass: No. 1 heavy copper and wire, 23.75; No. 2 heavy copper and wire, 21.75; light copper, 19.50; No. 1 composition borings, 21.00; No. 1 composition solids, 21.50; heavy yellow brass solids, 15.50; yellow brass turnings, 14.50; radiators, 16.50.

PLATING MATERIALS

(F.o.b. shipping point, freight allowed on quantities)

ANODES

Cadmium: Special or patented shapes, $1.70 per lb.

Copper: Flat-rolled, 46.79; oval, 45.00. 5000-10,000 lb; electrodeposited, 38.75. 2000-5000 lb lots; cast, 40.25. 5000-10,000 quantities.

Nickel: Depolarized, less than 100 lb, 114.25; 100-499 lb, 112.00; 500-4999 lb, 107.50; 5000-29,999 lb, 105.25; 30,000 lb, 103.00. Carbonized, deduct 3 cents a lb.

Tin: Bar or slab, less than 200 lb, 112.50; 200-499 lb, 111.00; 500-999 lb, 110.50; 1000 lb or more, 110.00.

Zinc: Balls, 17.50; flat tops, 17.50; flats, 19.25; ovals, 18.50, ton lots.

CHEMICALS

Cadmium Oxide: $1.70 per lb in 100-lb drums.

Chromic Acid: 100 lb, 33.30; 500 lb, 32.80; 2000 lb, 32.15; 5000 lb, 31.80; 10,000 lb, 31.30, f.o.b. Detroit.

Copper Cyanide: 100-200 lb, 74.80; 300-900 lb, 72.80.

Copper Sulphate: 100-1900 lb, 14.95; 2000-5900 lb, 12.95; 6000-11,900 lb, 12.70; 12,000-22,900 lb, 12.45; 23,000 lb or more, 11.95.

Nickel Chloride: 100 lb, 48.50; 200 lb, 46.50; 300 lb, 45.50; 400 lb, 43.50; 5000 lb, 41.50; 10,000 lb, 40.50.

Nickel Sulphate: 100 lb, 40.50; 200 lb, 38.50; 300 lb, 37.50; 400-4900 lb, 35.50; 5000-29,900 lb, 33.50; 30,000 lb or more, 32.50.

Sodium Cyanide: 100 lb, 27.50; 200 lb, 25.80; 400 lb, 22.80; 1000 lb, 21.80; f.o.b. Detroit.

Sodium Stannate: Less than 100 lb, 75.20; 100-600 lb, 66.20; 700-1900 lb, 63.50; 2000-9900 lb, 61.60; 10,000 lb or more, 60.30.

Stannous Chloride (anhydrous): Less than 25 lb, 164.70; 25 lb, 129.70; 100 lb, 114.70; 400 lb, 112.20; 5200-19,600 lb, 100.00; 20,000 lb or more, 87.80.

Stannous Sulphate: Less than 50 lb, 127.50; 50 lb, 97.50; 100-1900 lb, 95.50; 2000 lb or more, 93.50.

Zinc Cyanide: 100-200 lb, 59.00; 300-900 lb, 57.00.

(*Concluded from Page* 123)

won't offer more, and dealers will not accept less than present quotations on most items. Small railroad lists closing last week, however, showed a price decrease of from $1 to $2 per ton. The cast market remains firm, but some brokers anticipate a decline in sympathy with steel. No. 2 bundles are down $2 a ton.

St. Louis — Scrap trading continues slack. Fair stockpiles enable mills to hold firmly against the price rises which brokers say are necessary to bring out new tonnage. Vacations slowed scrap shipments from fabricators, and the harvest season is cutting down movement of rural scrap. Railroad offerings are unusually light. There is considerable speculative buying by dealers who still anticipate a strong pickup in September or October.

San Francisco — Steel scrap prices are holding at the recently established slightly lower levels. An undertone of weakness is noted in the absence of large scale buy-

FOREMAN

Progressive New Jersey organization has opening in supervision for experienced Drop Forge Foreman. Must be familiar with all phases of steam and board hammer operation. Top salary to qualified individual. All employee benefits. Write giving full details in first letter.

McWILLIAMS FORGE CO., INC.
FRANKLIN ROAD
ROCKAWAY, N.J.

WANTED

Slitter 24"—36" with recoiler, payoff reel and scrap cutter or baler. Late model. Write

Box 584, STEEL
Penton Bldg. Cleveland 13, Ohio

CLASSIFIED

Help Wanted

PLANT SUPERINTENDENT

For Steel Fabricating shop in metropolitan New York Area producing pressure vessels, tanks and other weldments of steel stainless etc. Must be thoroughly experienced in welded construction design, and welding equipment. Must be a good organizer and capable of taking complete responsibility. Liberal Salary for the right man and excellent incentive. Write Box 583, STEEL, Penton Bldg., Cleveland 13, Ohio.

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And Further information write
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Galvanizing Worries?
End Them by Contacting—
NATIONAL GALVANIZING COMPANY

Who will:

1. Do your galvanizing for you in the world's most modern and efficient galvanizing plant (which we would like you to consider your own private galvanizing department).

OR

2. Build and operate complete job galvanizing facilities in your city.

OR

3. Engineer and install modern, low-cost facilities to replace outmoded galvanizing operations.

NATIONAL GALVANIZING COMPANY
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Galvanizing facilities to process 200 tons of job work per day

FOR SALE
20 TONS ALNICO INGOTS
(30 lbs. each) CO + NI + FE=99.38%
Processed by Primary company
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DIESEL CHEMICAL & METAL CO.
578 S. Carroll Street, Brooklyn, N. Y.
Phone MAin 2-0703
Buyers—Sellers of all Nickel & Cobalt Alloys

FOR SALE
PRODUCTION WELDERS

A. C. Transformer Type
3—1000 Amp. Westinghouse "Flex-Arc" with Built in Capacitors, Type WC, 1 Ph., 60 Cycle, 440 Volt
Price $750.00 Ea.
1—750 Amp. DITTO, 220/440 Volts
Price $650.00
4—500 Amp. DITTO, 220/440 Volts
Price $500.00 Ea.

All above in good condition, as removed from Service. Offered subject to prior sale.
Some Heads and Control Equipment also available.

G. & A. ELECTRIC APPARATUS CO., INC.
315 Larkin Street—Buffalo 10, N. Y.
Phone: MOhawk 5421

HEAVY-DUTY VERTICAL MILLERS
—ELECTRONIC CONTROLS—

New REED-PRENTICE No. 4 Vertical Millers available for quick delivery—at reduced cost. Exclusive *electronic* controls for all feeds. Unsurpassed for precision milling. Write for descriptive folder and prices on 60" and 96" models.

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677 Cambridge Street
Worcester 4, Mass.

TESTING ENGINEER

Outstanding opportunity for young man with engineering degree desiring a position leading to supervisory responsibilities. Experience in testing of aluminum alloys desirable but not essential.

Moving expenses defrayed and excellent benefit program.

Please furnish complete history and background information; state salary requirements. Reply:

Employment Supervisor
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& CHEMICAL CORP.
Trentwood Works
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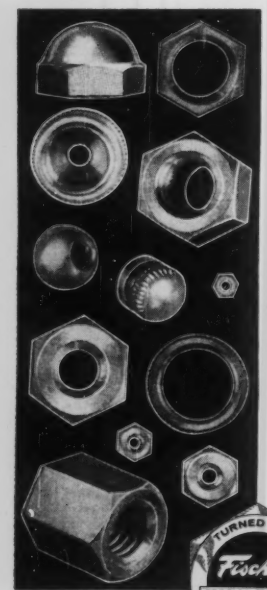
Fischer
produces
"specials"
everyday!



"Special" is our middle name. Regardless of your nut requirements, Fischer produces "specials" that will speed your assembly operations . . . and cut your costs.

Brass or Aluminum . . . your nuts will be produced on unique high-speed machinery . . . turned to exacting specifications . . . thereby eliminating "blanks" or rejects.

PRICE . . . you pay no premium. DELIVERY . . . it will be prompt.

Before you place that next order for brass or aluminum nuts . . . the ones you consider "special" . . . send your specifications to Fischer. You will receive immediate attention for price and delivery quotations.

there's no premium for precision with

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ing for export and domestic use.

Seattle—The market dropped $2 last week. No. 1 and No. 2 heavy melting are quoted at $44 and $42. Cast iron grades are unchanged. Mills in this area are buying in lesser volume, and the export movement is in a temporary blackout, accounting for this weakness. Exporters believe that Japan will be in position to resume purchases on a fairly large scale in October.

Pig Iron . . .

Pig Iron Prices, Page 118

The pig iron market remains quiet; no solid improvement in demand is expected until after the Labor Day holiday. Some foundries are expected to place larger commitments for iron early in September to replenish inventories.

In New England, most of the larger foundries supplying castings for textile mill equipment and machine tools are operating four days or less a week.

The Everett, Mass., furnace is expected to increase iron prices in the fourth quarter. The rise probably will be more than the 50-cent advance posted in the third quarter. Prices are based on costs in the previous quarter.

Iron Ore . . .

Iron Ore Prices, Page 120

Keel of a 729-ft ore carrier has been laid by Great Lakes Engineering Works, River Rouge, Mich. The vessel will carry nearly 27,000 tons of ore. It is being built as an investment by Northwestern Mutual Life Insurance Co., Milwaukee, and will be leased to Columbia Transportation Co., Cleveland.

Iron ore shipments totaled 2,948,063 tons in the week ended Aug. 19, compared with 2,305,039 tons for the like 1956 week, reports the American Iron Ore Association, Cleveland. The cumulative total for the season is 52,403,163 tons, an increase of 14,581,623 tons over the total a year ago.

Reflecting the high rate of shipments and accumulation of large stocks at lower lake ports, ore carrier operators are reducing operations or making plans for early curtailment. Interlake Steamship Co. has placed two carriers on the inactive list. As of Aug. 15, 249 vessels were in operation.

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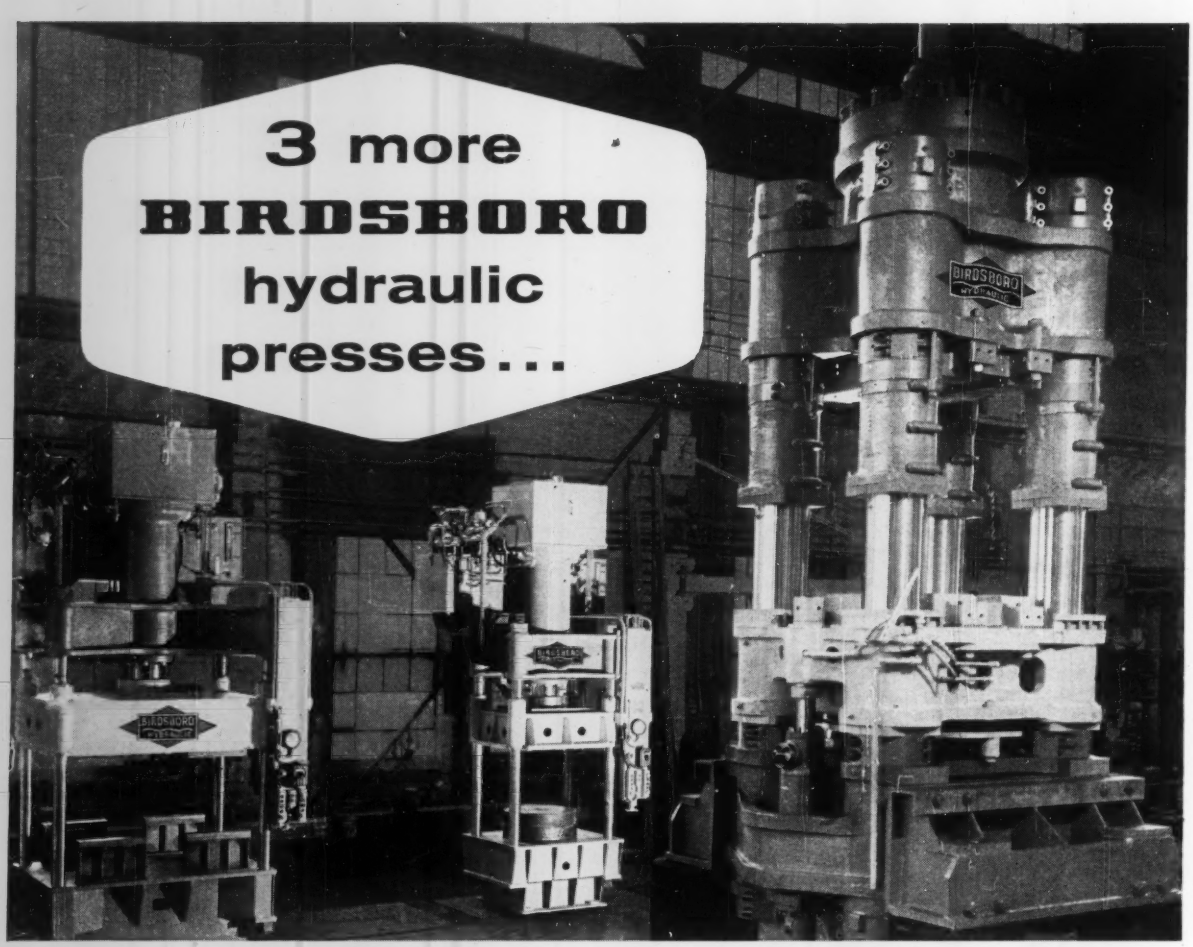
Cancer can't strike me, I'm hiding.

What I don't know won't hurt me.

Cancer?

Lots of people die of it, I know . . . but the American Cancer Society says a great many deaths from cancer are NEEDLESS *deaths. That's why I do what they tell me. I have an annual medical checkup however well I feel. I know the seven danger signals. And when I want sound information, I get it from my Unit of the*

AMERICAN CANCER SOCIETY



. . . being delivered to plants where speed and flexibility are demanded

• The 250-ton Press on the left has been delivered to Continental-Diamond Fibre Co., the center Press will operate at 250-ton capacity for Mica Insulator Company, and the 1500-ton Double Action Press on the right is now increasing production for the Wyman-Gordon Company. What sold these presses? Was it the desire for new production highs, or greater stamping accuracy, or greater production control? Or it might have been the important need for reduced costs made possible by the specialized knowledge and experience of our engineers. Call your BIRDSBORO representative, he'll be able to give you the details of the benefits you seek . . . *and get* when you specify BIRDSBORO Presses.

HP 27-56

BIRDSBORO HYDRAULIC

BIRDSBORO
STEEL FOUNDRY AND MACHINE CO.

BIRDSBORO, PA. New York Office: Engineering Supervision Co., 120 W. 42nd St., New York 36, N.Y.
District Office: Pittsburgh, Pa.

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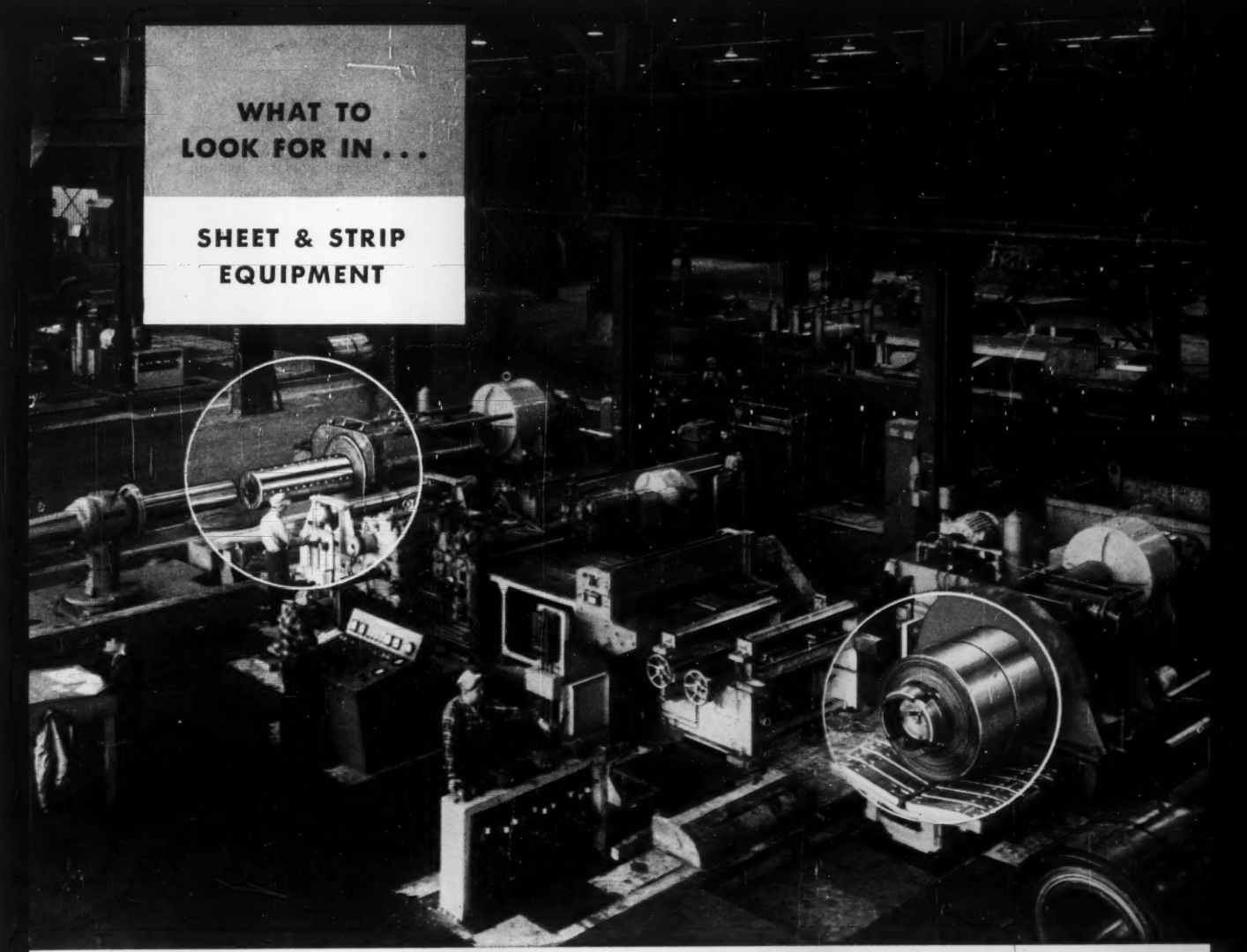

there's a DIFFERENCE IN REELS

Balanced Drum Segments, interlocked and chrome plated to prevent scoring of drum.

Shafts mounted in anti-friction bearings with ample thrust and radial load capacity.

Hydraulic traversing and elevating coil carriage.

Coil Stripping Device (Tension Reel) prevents telescoping of coil.

OPERATOR EASE: Adequate drum expansion permits loading or unloading coils easily Hydraulically operated strip aligner permits 6" movement either side of center line of line. Automatic Gripper Bar on Tension Reel grips strip from minimum to maximum without adjusting. Suitable for either over or underwinding of strip. On Payoff Reel, patented coil centering by adjustable stop plate supported by two round steel racks . . . easily adjusted with handwheel. Indicator gives operator a clear view of strip width.

EASY MAINTENANCE: Oil Seals of special split design for drive housing; circulating oil system for drive with separate motor drive. Balance of unit easily serviced by accessible fittings or centralized lubrication system.

GOOD DESIGN: 4-segment Drum provides more contact with coil I.D. The Tension Reel starts winding any coil in an almost perfect circle. Aetna's design of reels puts minimum unit pressure on sliding shoes when full weight of coil is on the drum.

RUGGEDNESS: Helical Gear Drive—quiet and smooth, strong, less weight; heavy structural steel weldment with machined ways provides a rugged strong base for high speeds without vibration

AETNA • STANDARD

THE AETNA-STANDARD ENGINEERING COMPANY

GENERAL OFFICES: PITTSBURGH, PA. **PLANTS: ELLWOOD CITY, PA., WARREN, OHIO**

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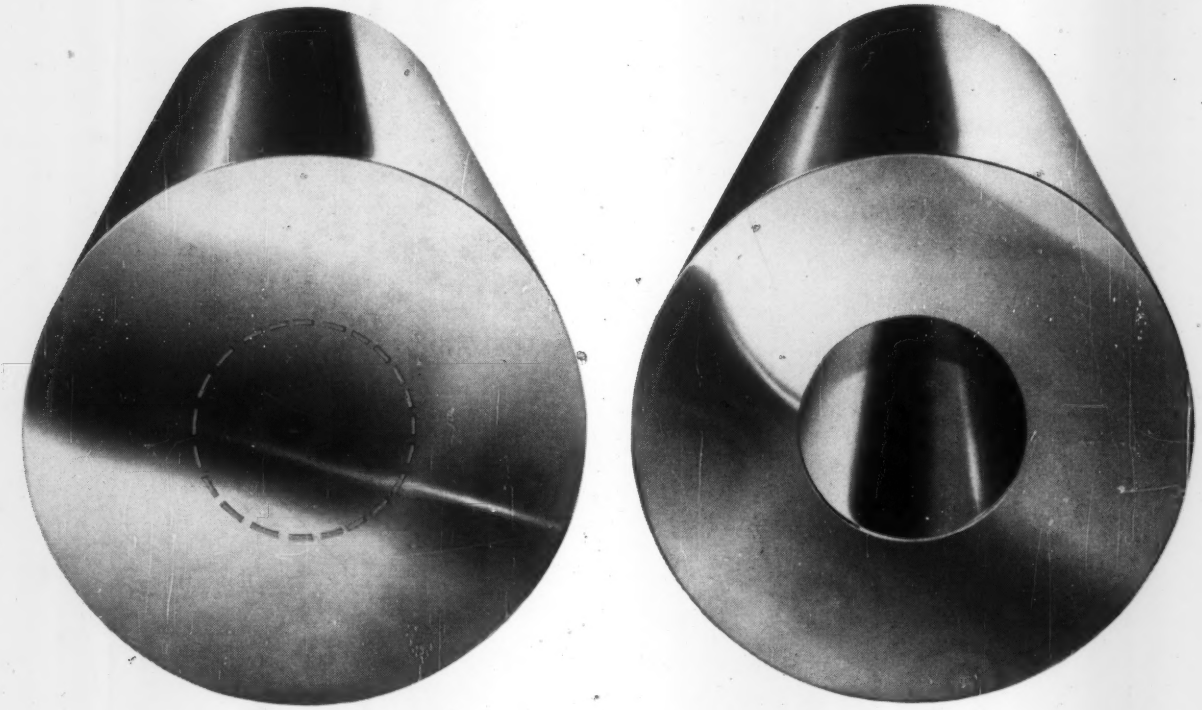

WHY BORE OUT BAR STOCK...

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IF you've been boring out forgings or bar stock to get the wall thickness you need to withstand higher operating pressures in refineries, steam plants or chemical plants, Timken® seamless steel tubing can save you money. The hole's already there. And you can get the wall thickness you need.

Timken seamless steel tubing is ideally suited to today's higher operating pressures. The piercing process we use gives it a fine forged quality. It also imparts a spiral grain flow for greater strength, a refined grain structure that brings out the best in the metal. And the quality you get is uniform from bar to bar, heat to heat, tube to tube. It's electric furnace fine alloy steel—quality controlled every step of the way.

Over 20 years of research and experience makes Timken Company metallurgists the recognized authorities on heavy wall pressure tubing. Ask the experts! Let them help you select—from 22 different analyses and sizes up to 11″ O.D.—the size and analysis best suited to your needs. The Timken Roller Bearing Company, Steel and Tube Division, Canton 6, Ohio. Cable address: "TIMROSCO".

TIMKEN *Fine Alloy* **STEEL**

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